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Clinical Types in Pulmonary Tuberculosis.—It appears more reasonable to explain variations in the clinical phenomena of tuberculosis in terms of the quantity of infecting germs and the intervals between infecting doses than by hypothetical differences in bacterial virulence. Small infections give extended opportunities for the acquisition of a relatively large margin of specific immunity. Large infections tend to swamp the immunizing responses of the body. A system of classification of pulmonary tuberculosis is referred to, in which are differentiated those cases with a history of previous manifestations of tuberculosis and those in which the disease bursts out in a fulminant form without any history of previous manifestations. The classification finally evolved is fully described in the *British Journal of Tuberculosis*, April, 1924. The classification is in accordance with the answers to the following questions: *1:* Is the disease of an "acute initial" or a "chronic recrudescent" type? *2:* What is the anatomical extent of the disease? *3:* What is the state of balance between infection and resistance? It was hoped, from the collection of information as to family history, place of upbringing, etc., of persons suffering from these main types, that evidence might be gained as to whether "acquired resistance" really does play an important part in the epidemiology of tuberculosis. Acute initial cases, with far-advanced disease and little resistance, were most often met with in adolescence and young adult life, and were most common in rural districts lately invaded by industrial enterprise or where members of primitive communities were brought for the first time in contact with "carriers" of the tubercle bacillus. The association of "contact" history with the more benign clinical types was noted in a large percentage of cases. There is strong support for the view that antecedent tuberculous infection leads to the acquisition of sufficient relative immunity to modify the course of tuberculous disease. *Conclusions:* In classifying clinical types it is not sufficient to indicate the anatomical extent of the disease and the constitutional state of the patient. Consideration should be given as to whether the present attack is of the "acute initial" or the "chronic recrudescent" type. There is reason to think that in the acute initial types the exposure to infection may

have been so massive in extent that there has been no time for the body to elaborate its defensive mechanisms to a degree adequate for the emergency. In such cases the prognosis is grave. In the chronic or recrudescent types the time and quantity factors have been more in the patient's favor, a considerable measure of resistance has been acquired and the prognosis is better. "Resistant," not merely "early," cases should be selected for sanatoria.—*The Significance of Variations in Clinical Type in Pulmonary Tuberculosis: an Analysis of 3,083 Case Records in Wales, S. L. Cummins, Tubercle, May, 1926, vii, 375.*—(*F. M.*)

Tuberculosis Problem.—Before the Great War, antituberculosis work in France was almost nonexistent; to-day it is insufficient. There are 53 sanatoria with 5,772 beds, but these are able to care for but a fraction of the tuberculous population. Multiplication of sanatoria seems a simple solution, but it is not so. For the rich the tuberculosis problem is relatively easy. They can remain in the sanatorium as long as necessary, and afterward lead a quiet life with plenty of rest and nourishment. For the working class tuberculosis is a calamity. Who will care for the family and children during the stay at a sanatorium? There the working man learns the lesson of complete rest, and too often thereafter becomes incapable of any effort, fearing that exertion may aggravate his condition. If he conquers his fears after leaving the sanatorium, he enters into competition with healthy workmen; the struggle is unequal and, sooner or later, he succumbs. Then comes relapse after relapse, one sanatorium stay after another, descent in the social scale, and the family reduced to poverty. Meanwhile he is constantly infecting other persons. What is to be done? There should be created special settlements or villages such as that at Papworth, England. This consists of (1) a hospital-sanatorium and (2) a village. Most forms of tuberculosis are not incompatible, after sufficient rest treatment, with a certain amount of activity. If this is properly adapted to the individual patient's capacity, it will not fatigue but will encourage him. Incidentally, at Papworth farmwork is almost banned as being too arduous for the tuberculous. When the patient has learned an occupation or trade and can work six hours a day he is transferred to the village. Here he resumes family life under medical supervision and is reimbursed for his work in addition to his disability allowance. The children go to an open air school, and no cases have developed among them. If the patient's condition relapses he is at once rehospitalized until deemed able to return.—*Comment résoudre le problème de la Tuberculose? Wolfsohn, Rev. Belge d. l. Tuberc., July, 1925, no. 7, 197.*—(*A. P.*)

Aspects of Tuberculosis Problem.—The death-rate from respiratory tuberculosis in England and Wales has decreased from 2.22 per 1,000 population in 1871–1875 to 0.84 in 1924, or 62 per cent. There has been some difference of opinion as to the factors responsible for this decline, which raises important questions. Also, notwithstanding this vast improvement, tuberculosis continues to be one of the chief causes of death and perhaps the most frequent source of adult disability. From an economic standpoint its importance is enhanced by the earlier age at which the most deaths occur, as compared with, for instance, cancer and heart disease. Tubercle has killed 96.7 per cent of its victims before they reach 65, while cancer has at that age only secured 60 per cent of its victims. More than half of the total mortality occurs between 20 and 65. With the single exception of the age period 20–25 there has been a marked decline in tuberculosis mortality at all ages in males; in females there is an exception between 15 and 25 years of age. *Childhood Tuberculosis:* The marked reduction of registered tuberculosis in the first five years of life needs some comment. It appears that some of this is actual, and some due to changes in death certification. The tubercle bacillus still claims a vast number of victims in infancy and early childhood, probably more than at any later age-period. Bushnell, Metchnikoff and Calmette, as well as others, point out that infants at birth may be in a similar position in respect of tuberculosis to that of remote races when first exposed. In these an acute and rapid type of tuberculosis develops. The survivors in thickly populated countries secure a partial immunization. The striking reduction in nonpulmonary tuberculosis is most satisfactorily explained by the fairly general substitution of pasteurized for uncooked milk, as well as the reduction in human infection. *Racial Suceptibility and Childhood Infection:* The facts do not necessitate an assumption of real racial differences in liability. It is indeed difficult to separate the essential influence of heredity from collateral differences of social life, personal habits, cleanliness, and varying degrees of exposure to infection. Even in the same community or family certain children survive, others perish. This difference is most naturally explained on the basis of frequency and dose of infection. Although Calmette's

current experimental work, if confirmed, opens up new possibilities of protection, it is meanwhile the counsel of wisdom to assume that minimum dosage of virulent bacilli occurs in instances of safe recovery from tuberculous infection, and measures must be adopted to minimize exposure of children to tuberculous invalids. This entails much detailed care in respect of housing, coughing, fondling, and cleanliness of hands and handkerchiefs. There is every reason to believe that discontinuity of infection greatly reduces the risk, and this is part of the end accomplished by removal of children to summer and seaside homes, more widely practised in France and England. It is probable that a large part of the danger occurs during the "crawling" stage of childhood, when infection of toys and fingers is especially apt to occur. *Respiratory Tuberculosis:* In England and Wales in 1923 the death rate from phthisis in females reached its maximum at the age-period of 15–25, while for males the highest rates occurred at 35–55. Generally, even in rural districts, the male rate is higher than the female after 25. There is a marked difference, however, between the male rate in rural districts and in large towns, although from decade to decade this difference is less striking. There is a remarkably small difference between the urban and rural death-rates for women. It may be said that the disease tuberculosis is the product of two sets of circumstances: (1) an adequate dosage of infection and (2) conditions favoring or impeding successful invasion of the disease. Both factors vary in different communities and social strata. *Rate of Decline:* Curves for New York City and for the registration area of the United States bring out that, although the death-rates are higher than in England, they show since 1900 a similar decline, with a much smaller interruption in 1918; also that the city death-rate is rapidly approaching the general rate. *Causes of Declining Death-Rate:* Newsholme, limiting his field to human sources, places the following factors first: *1:* Improved cleanliness of population, domestically and industrially, especially in regard to coughing and expectoration. *2:* Improved treatment and better hospital and segregation facilities. A steadily increasing proportion of sick are treated in hospitals. For London about half the total deaths from phthisis occur in hospitals, and the proportion in large American cities is quite as high. One may contrast and balance the opposing factors in tuberculosis mortality as follows: *Factors Making for Reduction: 1:* Gradual substitution of smaller less frequent doses of infection for larger and more frequent ones, which is brought about by (a) better personal habits, especially as to spitting, (b) reduction of dust and infection industrially, and (c) better care and segregation of the sick. *2:* Increased resistance, by improving hygienic conditions, working conditions and nutrition. *3:* Provision of means for prompt diagnosis and continued treatment of tuberculosis. *Factors Opposing Reduction: 1:* Steady increase in town life. *2:* Increasing replacement of outdoor by indoor occupations. *3:* Reduction of house-room. *Influence of Nutrition:* Improved nutrition appears to be an important factor in reducing tuberculosis mortality. It is conceivable that some deficiency in the dietary of the Irish may play a part in their excessive death-rate. At all events, the reduction in mortality in recent years has also been very great in Ireland. The experience of the English and Germans during the war appears to show an important part played by fats in resisting tuberculosis. Also, in England during the war nearly all workers suffered from overwork, including women, many of whom were suddenly thrown into industrial life. Then in 1918–1919 occurred the influenza epidemic, which like that of 1889–1890 foretold an excessive and hastened tuberculosis mortality. *Influence of Heredity:* This is very debatable ground. Although some statisticians and biometricians still attach importance to heredity as a predisposing influence, the terrible toll still taken in childhood does not support the view that the survivors of successive generations have become more resistant than in the past to tuberculosis. Newsholme believes that the gradual introduction of individuals in civilized communities to the tubercle bacillus explains better the resistance of such. *Future Action:* Our chief aim must be to minimize infection, especially among the very young and to promote all forms of child welfare work. There is also a need to link up sanatoria, dispensaries, hospitals and medical organizations. Of particular value are free expert medical examinations, introduction of occupational therapy, open-air schools, and better and more extended after-care for sanatorium patients. The practical points to be emphasized may be summed up as follows: *1:* The objects of all antituberculosis measures are to increase the resistance of mankind to infection and to reduce the amount and frequency of infection. *2:* The amount and frequency of infection are greater in consumptive families; . . . . and resistance to infection is at its lowest in such families. *3:* The age incidence of mortality from tuberculosis shows that the risk of acute tuberculosis and death is

greatest in the first two or three years after birth. *4:* The excessive incidence of tuberculosis in early childhood and the important part played by epidemic diseases in increasing tuberculosis emphasize the extreme importance of connecting closely tuberculosis work and child-welfare work and affiliating both with general public health work.—*An Address on the Present Position of the Tuberculosis Problem, A. Newsholme, Lancet, May 29, 1926,* ccx, *1021.*—*(A. P.)*

Tuberculosis Problem among Jews.—The tendency to benign forms of tuberculosis among Jews is attributed to their increased development of immunity. During and after the war there was a marked increase of tuberculosis among the Jews, and especially an enormous increase of phthisical Jewish children.—*Das Tuberkuloseproblem bei den Juden. Eine rassen- und sozial-pathologische Studie, N. Haltrecht, Beitr. z. Klin. d. Tuberk., 1925, lxii, 442.*—*(H. J. C.)*

Development of Tuberculosis Institutions in Massachusetts.—Shortly after learning of the pioneer work of Brehmer and Dettweiler in Germany and Trudeau in America, Bowditch, feeling convinced that much more could be done for the cure of tuberculosis in the rigorous New England climate than had been thought possible, made an appeal to wealthy Boston people, with the result that the Sharon Sanatorium, at first a single building for 8 patients, was opened in the winter of 1891. It was soon enlarged, and now includes a children's pavilion, which combines the advantages of a sanatorium and open-air school, with graded instruction for children from 6 to 14 years of age who have been exposed to infection and are below par. To Alfred Worcester of Waltham belongs much credit for persuading the State authorities to establish the first State sanatorium in the Union, at Rutland, Massachusetts, which was opened in 1898. Time proved the need of other State sanatoria, and three others were established under the guidance of Arthur T. Cabot at North Reading, Lakeville and Westfield, the last having been recently given over entirely to the care of children. Also, throughout Massachusetts local hospitals developed provision for advanced cases of disease. More recently, the necessity of institutions for nonpulmonary forms became manifest, and the Lakeville State Sanatorium was selected for this purpose. Various medical and lay societies were also created. The Boston Tuberculosis Association may be called the parent society of the Massachusetts Tuberculosis League, which has relations with local associations all over the State, and exerts a powerful educational influence. Wherever active disease, pulmonary or otherwise, exists, sanatorium or hospital care is paramount. More careful observation of undernourished delicate children, who have been exposed in their homes, is essential, and the increasing number of "preventoria" is a hopeful sign. The prejudices which at first arise are banished by actual experience. In the care of tuberculosis children, Chadwick, at Westfield, has set the pace and open-air schools are exerting a more and more beneficent influence. At present perhaps the most important problem is that of the after-care of patients who have been successfully treated in sanatoria but cannot safely return to their former occupations and require supervision. For these the establishment of industrial colonies is the next step. Krause has emphasized the fact that present inadequate after-care is the big gap in our whole tuberculosis scheme. Such a movement is now under way under the supervision of Bayard T. Crane, Superintendent of the Central New England Sanatorium and Industrial Colony at Rutland, and is based on the same principles as the now famous Papworth Colony near Cambridge, England. The recent establishment of the Potts Memorial in New York State marks a step in the same direction.—*Landmarks in the State's Care of the Tuberculous, V. Y. Bowditch, Boston M. & S. J., May 13, 1926, cxciv, 882.*—*(A. P.)*

Meeting of Massachusetts Tuberculosis League.—In a recent number of the *Boston Medical & Surgical Journal* are published several papers read at the annual meeting of the Massachusetts Tuberculosis Association April 26, 1926. These papers are *The President's Address—Report of Progress* by Kendall Emerson; *The Broadening of the Tuberculosis Problem* by Linsly R. Williams; *The Importance of Measures to Combat the Present High Rate of Mortality from Tuberculosis among the Age-Groups Between Fifteen and Forty-five* by Edward O. Otis; *Possible Fields For Expansion of the Activities of Tuberculosis Associations* by George H. Bigelow; and *Tuberculosis and Industry* by McIver Woody. The first paper is an address and touches on general matters. Dr. Williams's paper presents in some detail the authorized forms of tuberculosis work for which funds secured through the sale of Christmas seals, etc., may be expended. He also outlines the requirements to be fulfilled by an affiliated State association requesting the use of a part of the seal-sale fund to inaugurate a campaign for the prevention of heart disease. Requirements for a statewide program for

tuberculosis is given. The rest of the papers are somewhat similar in that they all stress the necessity for periodical health examinations while the individual still feels healthy, as an aid in the prevention of tuberculosis. Dr. Otis points out that chronic fatigue is an important cause of the heavy mortality between the ages of fifteen and forty-five.—*Boston M. & S. J., May 6, 1926, cxcv, 814.—(J. S. W.)*

Tuberculosis in Japan.—Since the Russo-Japanese war, the Japanese have worked hard in trying to adopt European ways. But in the effort to become westernized they have acquired many bad points as well as many good ones. In great contrast to the bodily cleanliness of the people, the general sanitation and many of their personal habits leave much to be desired. Open sewers are the rule all over Japan, and the sewage is used to water the dusty roads during the hot summer; fortunately, however, the antiseptic properties of the powerful and prolonged sunshine minimize dangers that might otherwise arise. The incidence of tuberculosis, as given by Maki, is between 250,000 and 300,000 per one million population. The population of Japan proper is 59 million, and the mortality from tuberculosis of all kinds in 1922 was said to be 300,000. The diagnosis of tuberculosis is looked upon with such horror by the people that the physician, in order to maintain friendly terms and not lose the patient, calls it something else. Medical practice is highly commercialized. The death-rate reaches its highest point between the ages of 15 and 25, diminishing gradually with advancing years. Diet is one of the contributing factors to the incidence of tuberculosis. For the majority, rice is the principal food, deficient in fats and vitamines. The Japanese woman has numerous children and lactation is a never-ending event. The infant is generally carried on the mother's back by a tight binder tied around its chest and fixed to the mother's body. This prevents proper pulmonary expansion for both. The chest measurements of adult Japanese reveal that the anteroposterior diameter is smaller in proportion to that of Europeans. The Japanese house is easily kept clean because of the absence of furniture, and ventilation is facilitated by the many sliding doors. Houses must be cleaned twice a year according to Japanese law, but no provision is made for disinfection after the death and removal of a tuberculosis patient. Sheets are not used on their mattresses; they cover themselves with a heavy kimono, and, once these become contaminated, they act as a fertile source for the spread of tuberculosis. Every Japanese spits whenever and wherever he feels inclined. Human excreta are used as manure, and this is an important factor in the propagation of the disease in a country where half the population suffers from active forms of tuberculosis at some period of their lives. Ninety per cent of the population harbors intestinal parasites and these serve to interfere with nutrition and to lower resistance. Many of the school teachers are tuberculous. There are eight municipal and one prefectural sanatoria in Japan, totalling 1,420 beds, far too small a number for the vast number of active cases. Hospital buildings are of European architecture, but lack cleanliness and sanitation. Spitting is no less prevalent among the nurses than among the rest of the community. The great handicap to progress in sanitation and to the enforcement of laws for the prevention of tuberculosis is the lack of education and the failure by the population to realize both the way in which the disease spreads and the importance of hygiene. The system for combating tuberculosis in Japan is conspicuous by its absence.—*Tuberculosis in Japan, C. Nicory, Tubercle, August, 1926, vii, 530.—(U. E. Z.)*

Pirquet Tests in India.—A study of the test was made in 3,392 cases of clinically tuberculous and nontuberculous patients. Every individual received three scarifications, one of 100 per cent and one of 50 per cent O. T., and a control scarification with 50 per cent glycerine in salt solution. A mild flush at and immediately around the scarification was indicated by a single plus; slight edema at the site, with a halo of redness extending for 3 mm. around it, was classed as double plus; and a definite edematous infiltration involving the scarification and extending for 5 mm. or more around it was noted as triple plus. Below the five-year level and for the age-period 71 to 80, the infection-rate was higher among females. With these exceptions the infection-rate was about equal in both sexes. By the end of the first year of life about 40 per cent of the children are infected; by the end of the second year, 65.7 per cent; and by the end of the fifth year, 80 per cent. These figures indicate a very high prevalence of tuberculosis in the city of Madras. The infection-rate for the general population is 94.2 per cent, with no appreciable difference between males and females. About 31.2 per cent of the clinically nontuberculous persons gave strongly positive reactions. Only when the cutaneous reaction is combined with other clinical signs and symptoms can the test be considered a factor of value in diagnosis. Of all clinically tuberculous

individuals, 96.7 per cent gave positive reactions of varying degrees. Cases reacting violently to a 1:500 dilution of O. T. are dangerous for tuberculin therapy. Some patients have a marked reaction even after the control scarification with glycerine in saline solution. This is due to some circulatory disturbance incident to a tuberculous toxemia. In these cases the prognosis is bad. The pathology of such a reaction is akin to the dermatographia noticed in tuberculous cachexia, a sign of vasomotor paralysis. There is a marked fall in the cutaneous sensibility to tuberculin in the advanced stages.—*The Diagnostic Value of the Cutaneous Tuberculin Test in Tuberculous Infection in India, M. Kesava Pai and C. A. Venngopal, Tubercle, August, 1926, vii, 521.*— (*U. E. Z.*)

Incidence of Tuberculous Infection in Early Life in City.—Parisot and Saleur studied 1,090 children, ranging up to 16 years of age, at Nancy. At the Villemin dispensary the children underwent, from 1923 to 1925, complete clinical, radiological, bacteriological and special examinations, including investigations of their families. The Pirquet test was employed. It was sought to determine the general incidence of tuberculous infection in early life; also its distribution among children taken exclusively from tuberculous families, and to compare this with the distribution in children from nontuberculous families. *Results: 1:* Among the general group, irrespective of family infection, tuberculous infection was found to occur in 13 per cent under 2 years of age, and to increase progressively to 71 per cent in children from 11 to 16 years. *2:* Among 367 children from families where there was active open tuberculosis, 42 per cent of those under 2 years were found infected, 82.5 per cent of those under 5 years, and 91.5 per cent from that age on. *3:* Among children from nontuberculous families no child under 2 years was found infected, from 2 to 5 years 8.7 per cent, from 5 to 11 years 31.6 per cent, and from 11 to 16 years 57.4 per cent. *Conclusions:* Infection occurs unusually frequently in a tuberculous family environment, even in the very earliest years of life. Those living away from such sources of infection derive their infection in later childhood from the usual social and environmental sources of contact.—*L'infection tuberculeuse du jeune âge dans une grosse agglomération urbaine (d'après 1,092 cutiréactions à la tuberculine), J. Parisot and H. Saleur, xviii Congrès Français de Médecine, July 16–19, 1925, reported in Presse Méd., August 19, 1925, no. 66, 1111.*—(*A.P.*)

Tuberculosis Mortality in Hungary.—The morbidity of tuberculosis in Hungary is still higher than in the pre-war period, because of the poor social conditions and poor nutrition consequent to the war. The hospitals are not of sufficient capacity to segregate the open cases.—*Die Rolle der sozialen Faktoren in der Tuberkulosemortalität, W. v. Friedrich, Ztschr. f. Tuberk., 1926, xliv, 193.*—(*H. J. C.*)

Tuberculosis Mortality in Saxony.—The vicinity of Pirna has the highest tuberculosis mortality, being permanently above the average for the entire State, this being due to the presence of a sandstone industry. Similar findings obtain for the Freiburg mills. As a whole, the agricultural regions have a lower mortality than the majority of the industrial centres, but the vicinities of Löbau, Rochlitz and the Vogtland have mortalities like those of the farming regions. Because of the difficulty of obtaining food sanatorium inmates fared badly during the war.—*Die Tuberkulosesterblichkeit im Freistaat Sachsen, F. A. Weber, Ztschr. f. Tuberk., 1925, xliv, 3.*—(*H. J. C.*)

Nonpulmonary Tuberculosis Death-Rate in New York City since Milk Pasteurization.—In 1912, when pasteurization in New York City was begun, about 50 per cent of the City's supply was being pasteurized. In 1914, pasteurization was made obligatory by the law for all except certified milk. The City's death-rates for nonpulmonary tuberculosis since 1910 have been as follows:

Nonpulmonary tuberculosis death-rates, 1910–1925

YEAR	RATE PER 1,000 POPULATION	YEAR	RATE PER 1,000 POPULATION
1910	0.29	1918	0.24
1911	0.30	1919	0.20
1912	0.28	1920	0.17
1913	0.28	1921	0.14
1914	0.27	1922	0.13
1915	0.27	1923	0.12
1916	0.23	1924	0.14
1917	0.24	1925	0.12

Previous to pasteurization, more than 50 per cent of cervical tuberculous lymphadenitis was due to the bovine bacillus, but in only 6 of 50 specimens since general pasteurization has the bovine bacillus been found, and 5 of these 6 were from patients formerly residing out-of-town and fed on

raw milk.—*Weekly Bulletin, Dept. Health, City of New York, August 21, 1926.*—(*A. K. K.*)

Broadening Tuberculosis Program.—The first institution in the United States for the care of the tuberculous was the Channing Home (for women) which was opened in 1857. In 1878 a private sanatorium was opened by Dr. Joseph Gleitsmann in Asheville, North Carolina, and in 1885 the Adirondack Cottage Sanatorium by Trudeau. The first voluntary tuberculosis association was created in Pennsylvania in 1892, and the first municipality to offer a hospital for consumptives was Cincinnati in 1897. The first state sanatorium was opened at Rutland, Massachusetts, in 1898. The National Association for the Study and Prevention of Tuberculosis was organized in 1904, and is now the National Tuberculosis Association. In 1908 was held the International Congress on Tuberculosis in Washington, D. C., under a special committee headed by Flick of Philadelphia. An important address was made by Newsholme, pointing out the necessity of providing institutional care. From the scientific work preceding this session were evolved certain definite policies. The members of the Board of the National Tuberculosis Association have always opposed the organization and maintenance of institutions by the Association or any local association, but nearly all of the public sanatoria have been constructed as a result of their combined efforts. Early in the campaign for hospital beds Biggs, in New York, urged that there be created at least as many beds for tuberculosis patients as the number of annual deaths from this cause. Massachusetts and New York now very closely approach this 1 to 1 ratio. The use of sanatoria for only early cases, as at first contemplated, has not proved practicable. A study made by Alice Hill of the National Tuberculosis Association of 12 representative institutions in widely different states showed that in 1914 the proportion of patients with minimal disease was 11 per cent of the total, and of far-advanced cases 55 per cent. In 1924 the proportions were 15 per cent minimal, and 41 per cent far-advanced. Either patients are dilatory in presenting themselves for examination, or physicians are negligent in making a diagnosis. In 1913 a subcommittee of the National Tuberculosis Association investigated 25 institutions for the care of advanced tuberculosis and found many unsatisfactory features. Progress has been made in sanatorium construction and management, and sites are now better chosen and buildings more suited to the proper care of patients. In 1919 an Institutional Advisory Service was created and maintained by the National Tuberculosis Association under the direction of T. B. Kidner. This has been of material assistance in planning and equipping new institutions. An important error in the past has been the remoteness of the institution from medical centres, with resulting lack of association of superintendent and staff with these centres and consequent impaired efficiency of the service. Our populous counties should follow the example of England in arranging a scheme for coördinating dispensary, hospital, health department, and nursing service. Massachusetts, always a leader, undertook years ago a program for construction of sanatoria by state, county and city, and is now urging special examinations for children who may be presumably infected, if not already affected.—*The Broadening of the Tuberculosis Program, L. R. Williams, Boston M. & S. J., May 13, 1926, cxciv, 884.*— (*A. P.*)

Antituberculosis Campaign Abroad.—In most of the European countries visited the work is achieved by voluntary associations. In England all antituberculosis work is controlled by the Ministry of Health. There is considerable opposition to notification of tuberculosis of any form in France and Holland. In Austria and Belgium contagious cases are reported; whole-time tuberculosis officers are quite the exception; sanatoria are mostly owned by the voluntary associations; and the accommodation is frequently graded into first, second and third classes, according to the means of the patients. Belgium and Holland each maintain a sanatorium in Switzerland. Most of the public hospitals have special wards or annexes for tuberculous patients. The hospitals of Austria, Czechoslovakia and Hungary are well built, splendidly equipped and up to date. The teaching facilities are excellent and an enormous amount of research work is carried out. Tuberculin is still extensively used for diagnostic purposes on the continent, although it is relatively little used in England. Except in Holland, treatment by artificial pneumothorax is increasing in popularity everywhere, and thoracic surgery is being more and more practised. Tuberculin is still used for treatment in Central Europe. Heliotherapy is employed for surgical cases whenever feasible. Natural and artificial sunlight are frequently utilized in cases of tuberculous laryngitis. As regards prophylaxis, while most of the efforts on the Continent are devoted to the protection of the children, relatively little attention is paid, officially

at all events, to the bovine bacillus in milk as a source of disease in the human subject. The wonderful record of the Grancher foundation is well known. More recently Bernard and Debré have introduced a new system, by which the children are separated from the parents and boarded out in healthy peasant families till the age of four years. In France and Czechoslovakia prominence is given to postgraduate teaching in tuberculosis. As the death-rate from all forms of tuberculosis in 1923 per 10,000 was 39.40 in Budapest and 33.14 in Prague, as contrasted with 9.3 in Amsterdam and 11.60 in London, the need for preventive measures in Central Europe is obvious. *Conclusion:* While funds for antituberculosis work are much greater in England, a much larger proportion of them is spent on treatment; on the Continent attention is principally centered on prevention and the care of delicate and predisposed children.—*Some Impressions of the Antituberculous Campaign at Home and Abroad, W. H. Dickinson, Brit. J. Tuberc., April, 1926, xx, 67.*—(*F. M.*)

Field of Sanatoria in Tuberculosis Campaign.—The sanatoria will achieve the greatest usefulness in the fight against tuberculosis only if the patients for admission are judiciously selected. Desperate cases do not belong there. But it is still more important at the present time to realize that there is a whole group of cases, which have undoubtedly a respiratory disease of tuberculous etiology but nevertheless are "sanatorium parasites," because they do not need any sanatorium treatment. These cases of benign tuberculosis are not potential phthisics. The clinical differentiation of tuberculosis has been especially advanced by Bard and Piéry. Based on their work, W. Neumann has elaborated a detailed symptomatology of the various types of pulmonary tuberculosis. Benign tuberculosis is known to other authors by various names: *pulmonary tuberculosoid* (Neisser and Braeuning); *tuberculosis of lymphatics* (F. Kraus); *endothoracic tuberculosis* (Kraemer and Philippi); *tuberculous intoxication* (Hollós); *morbus Kochii* (Schulz). All these authors agree that these cases, including the so called apical, bacilli-negative cases of long standing, never develop progressive pulmonary tuberculosis; and that, therefore, their treatment in sanatoria does nothing in preventing tuberculosis. True phthisis has usually a much more definite clinical onset than these cases of indefinite malaise, fatigue, pains, anorexia and insomnia, and indefinite apical X-ray findings. In follow-up work, comprising cases which had been under hospital care twelve to fourteen years ago, all cases of "benign tuberculosis" had a definitely good prognosis. Under this heading came the following groups: primary complex, tuberculosis of the bronchial lymph nodes, abortive apical tuberculosis, recurrent pleuritis and *tuberculosis miliaris discreta.* The *tuberculosis fibrosa densa* or *diffusa*, which occasionally shows a positive sputum, may in rare cases need sanatorium treatment if it presents signs of recurrent miliary propagation. All the other forms mentioned should not be admitted to the sanatorium but should be treated with tuberculin.—*Können die Heilstätten im Kampfe gegen die Tuberkulose mehr leisten? A. Frisch, Wien. klin. Wchnschr., June 17, 1926, xxxix, 720.*—(*M. P.*)

Outlook of Tuberculosis Campaign in Germany.—It is believed that the tuberculosis campaign must be handled by the State to ensure success. General tuberculosis prevention must be based on the protection of the healthy from infection by the diseased, and to increase the resistance of the communities as a whole. Home hygiene is the keynote in tuberculosis prevention. Open cases of tuberculosis should be made stationary and given treatment.—*Wie muss die Tuberkulosebekämpfung in Deutschland aussehen? R. Güterbock, Beitr. z. Klin. d. Tuberk., 1925, lxi, 583.*—(*H. J. C.*)

Antituberculosis Measures in Denmark.—In 1900 the death rate from tuberculosis in Danish towns was 23 per 10,000 population, and the aggregate deaths for the population of 2,400,000 is estimated to have exceeded 5,000. At that time England had the lowest mortality rate from pulmonary tuberculosis, 13.6 per 10,000 population; Belgium and Denmark had a rate of 18; Ireland, Sweden, Switzerland and Germany between 20 and 23; and France, Russia and Austria-Hungary even exceeded 30 per 10,000. The first Danish tuberculosis Sanatorium, Vejlefjord, was opened in 1900. In 1905 the Danish Rigsdag passed the Danish Tuberculosis Acts, which rendered possible an extensive program. Isolation and treatment of tuberculosis patients in hospitals were made the chief points. As soon as a sufficient number of institutions for treatment were established, dispensaries were provided in the larger towns, while the smaller towns and country districts carried out this work through the district unions of the National Association. Extensive provisions of State grants and grants-in-aid, together with private contributions and efforts, enabled the erection of sanatoria and hospitals and their maintenance. About 60

per cent of the total adult population are members of State recognized sick-benefit clubs or other clubs on a similar economic basis, and the grants-in-aid contribute up to three-fourths of their expense for treatment and nursing. The Tuberculosis Acts provide for (1) obligatory notification of cases, (2) disinfection, free of charge, after death or removal of a patient, (3) Free sputum examinations, (4) free education of tuberculous children in special departments or schools, and (5) provisions of grant-in-aid from State and municipality for working expenses of tuberculosis stations (dispensaries). These State grants-in-aid greatly increased during the Great War and immediately afterward, reaching a maximum in 1920, with a well-marked decline since. There are at present 72 tuberculosis institutions in Denmark, with 3,458 beds. There are 107 beds per 100,000 population, giving for every 100 deaths 115 available beds, a number exceeding that of any other country. In 1922 these institutions cared for 8,635 patients. At the present time deaths due to pulmonary tuberculosis to a large extent occur in hospitals, especially in the metropolitan district (70 per cent in Copenhagen). The rural population is somewhat more reserved in seeking admission into a hospital, but in 1924, of patients in whom a diagnosis was established, 75 per cent were admitted into institutions and 40 per cent of deaths occurred there. Denmark now has the lowest tuberculosis mortality of any European country, 89.6 per 100,000 population. In 1916 and 1917 there was a temporary increase, but otherwise the decline has been steady, including both sexes and all age groups. Especially noteworthy has been the decline in childhood mortality, 70 to 75 per cent.—*The Combating of Tuberculosis in Denmark, J. Ostenfeld, Tubercle, October, 1925, vii, 6.—(A. P.)*

Interchange of Tuberculosis Medical Officers.—The first interchange of specialist medical officers (tuberculosis) was held, under the auspices of the League of Nations, in the early part of 1924, and lasted three months. The party consisted of representatives of Great Britain and all Europe. In general, the capital of each country was first visited. There the general plan and organization of the national antituberculosis campaign was explained, and visits were paid to dispensaries, hospitals, clinics, sanatoria, etc., in town and country. French and English are the official languages of the League, but the majority of the delegates were more conversant with German and, therefore, it was more generally used except in France and England. The plan of the antituberculosis campaign naturally varied greatly in the different countries. In each State excepting France some form of social insurance was in force. As regards administration, there was lack of coöperation between the authorities dealing with tuberculosis and the officials engaged in other public work. Owing to changes consequent to the Great War, exact statistics relating to deaths were often difficult to obtain, but, generally speaking, the mortality has decreased in the large towns since 1919. On the other hand, it was stated that the disease was actually on the increase in the country districts of France and Hungary. *Dispensaries:* The ownership of the dispensaries was vested in very different bodies, such as the *Krankenkassen*, tuberculosis associations, districts, etc. The dispensaries of the *Krankenkassen* were not exclusively used for tuberculosis cases, but received patients suffering from all diseases. Medical work was carried out on the part-time principle, but in the larger centres the general administration was in the hands of whole-time officials. Diagnosis was the function of the dispensaries. *Sanatoria:* These varied, in size, between 50 and 300 beds. On the average, only about 50 per cent of the patients were sputum-positive. To prevent unsuitable cases gaining admission to the sanatoria, the rule was that applicants be examined by an approved medical board. *Hospitals:* On the continent, notably in countries which formerly formed part of the Austro-Hungarian empire, there exists a very comprehensive hospital system. For example, in one town of 50,000, there was a finely equipped general hospital with 900 beds. The institutions are usually owned by the state, province or municipality, and the accommodation is differentiated into first, second and third class, the third class being free. *Convalescent Homes:* This heading includes convalescent homes proper, day camps, open-air schools, preventoria, and institutions for delicate children. The class of case admitted varied very considerably, but patients with positive sputum or suffering from active disease of the bones and joints were not accepted. *Treatment:* The general principles of treatment were found to be the same everywhere; namely, rest, good food and fresh air. Tuberculin was employed, chiefly in German-speaking countries, both subcutaneously and by inunction. Except in Holland artificial pneumothorax was in very general use. Phrenicotomy and thoracoplastic operations were practised to a considerable extent. *Pathology:* The respiratory tract is generally accepted as the usual channel of infection. Great attention was being given to the X-ray pathology

of pulmonary tuberculosis, the lesions being classified into exudative, productive and fibrotic types, according to the size, shape and consistence as registered on the negative. *Diagnosis:* First, as regards physical examination, much more importance appeared to be attached to auscultation than to percussion. The roentgen-rays were utilized freely in practically all the institutions visited. Tuberculin as a diagnostic agent was everywhere used, especially in children. For the detection of tubercle bacilli the Ziehl-Neelsen method of staining was used. *Prophylaxis:* Great efforts were being made to inform the public concerning the symptoms of tuberculosis, the methods of cure and the facilities available for diagnosis and treatment, and to encourage healthy individuals to take an active part in protecting themselves against disease.—*First Interchange of Specialist Medical Officers (Tuberculosis), W. H. Dickinson, Tubercle, August, 1925, vi.*—(*W. W.*)

Position of Practising Physician in Antituberculosis Movement.—This is a sharp polemic against the central committee for combating tuberculosis, the sanatorium physicians and the dispensaries. The main work in antituberculosis measures should be undertaken by the practising physician. After-treatment at home is made more difficult by treatment in the sanatorium.—*Die Stellung des praktischen Arztes in der Tuberkulosebekämpfung, G. Zickgraf, Centralbl. f. Inn. Med., 1926, xlvii, 162.*—(*H. J. C.*)

Bodily Constitution and Type in Disease.—From almost the beginning of medical history the rôle of constitution has been recognized, yet very little accurate scientific knowledge of the subject is available. Ultimately, much statistical and biometrical control are required, but at present general morphological data are needed. It is as important to ascertain what to measure as it is to make the measurements. One is highly optimistic who can survey the enormous accumulation of anthropometric figures and indices without a feeling of disappointment over the almost complete absence of explanation or analysis of causal elements. The very simple and significant differences in cephalic index have scarcely given the slightest clue to the cause of head shapes or racial relationships. This is not to be taken as a criticism of the anthropometric method, but the way in which it has been employed has not proved very instructive. *Statement and Definition of Problems:* The terms *type* and *constitution* are not synonymous, the former indicating a fundamental fixed character, the latter one subject to variation and modification. From a medical standpoint scarcely anyone has sought to determine the basis or origin of a definite type or constitution. There must be some uniform criteria for contrasting the kinds of constitutions before we proceed further. However, physicians interested in disease have largely proceeded the other way around, believing or recognizing intuitively a tendency in certain kinds of people to certain diseases. Many have been convinced for example that a "tuberculous type" of person exists, but are unable to describe such a particular "type" except in rather vague and indefinite terms. What is there about the composition or constitution of such a patient which renders him more susceptible to such a disease? Is the difference genetic or developmental in origin, or both? Draper, in his recent exhaustive medical and anthropometric study of certain disease-groups, confined his material to patients between the ages of 18 and 60, thus eliminating most growing or developing individuals. Constitution may be said to be a developmental condition, depending to a large extent on the genetic composition of the individual, but also to an important degree on the manner of development and growth. If differs at different periods. The prenatal period is probably most important in determining later conditions, since at this time the actual gross bodily form and structure are being laid down, yet this period has been largely neglected, and is almost unknown to the majority of physicians. The final adult constitution is affected and influenced by both internal and external factors. Certain races tend to show characteristic constitutions, yet there are individuals among all races which show widely divergent patterns. The hereditary background of certain disturbances and changes in the germ plasm is reviewed. It has long been recognized that certain germ cells in a parent may be weak and defective, and it frequently happens that peculiar genetic abnormalities arise among apparently good stock. Sewall Wright's studies on guinea pigs are cited. Also certain chemical treatments seem to affect some of the germ cells, causing these to give rise to poorly developed or abnormal individuals. Baggs and Little subjected mice from a well-known stock to short X-ray exposures. The first few generations were quite normal but, later, abnormalities appeared, and by selection a breed with underdeveloped and abnormal eyes was produced. Among others an abnormal kidney condition occurred, and this could be bred almost 100 per cent pure. It thus appears that the constitution of these mice was highly modified and rendered

subject to structural diseases rare among the general stock. Of similar nature are defects due to arrested or disturbed development, which definitely alter type and constitution. Various human types, as well as types among lower animals, should be clearly recognized as definite growth reactions, which result from slight distortion in either internal or external developmental factors. The dwarf or infantile type is generally recognized, and perhaps its best understood example is the ordinary thyroid cretin. Other types, as midgets and achondroplastics, are probably of more complex origin. Similar dwarf types exist among dogs, and are bred by rigid selection of the stock. Such are the King Charles spaniel and Pekingese breeds. Among dogs gigantism is shown by the Great Dane, St. Bernard, Newfoundland and others and, as in man, is commonly associated with acromegalia. One finds all gradations between such extreme types. The structural expression of individuals oscillates between certain delicately balanced growth tendencies which are greatly influenced by environmental conditions during development. The rate of growth and differentiation is variable. Rate of growth no doubt depends on the rate of metabolism or oxidation, which is influenced by slight differences in activity of various glands, especially the thyroid. In the study of human beings extensive analysis reveals two chiefly clearly contrasted types. Anthropologists have long recognized these, which, roughly speaking, are the long heads and the round heads. In general, it seems that all old and more or less sedentary races residing near the coast tend toward the linear, long head, or high thyroid type, while the mid-continental people far removed from the sea and the source of iodine tend to a more rounded condition, a low thyroid or lateral type. Recently Draper, of New York, has been conducting a study of various disease-group individuals, from which two contrasting types stand out prominently, the gall-bladder group, which seems to be composed largely of lateral type individuals, and the gastric or duodenal ulcer group, quite uniformly composed of linear type individuals. Even to fine detail, such as tooth pattern and hand and nail shapes, these groups differ characteristically. The only other typical group shown by Draper's measurements was a small number of acromegalics. These had large subcostal angles and an average profile tending toward the acromegalic picture. The fundamental problem seems more to be to clearly determine the controlling elements in development and differentiation of human constitution. Then it becomes highly important to devise more clear-cut scientific methods of distinction. The entire subject urgently needs study and investigation. The practical application of this work lies in a better appreciation and understanding of the patient.—*Constitution and Type in Relation to Disease, C. R. Stockard, Medicine, May, 1926, v, 105.*—(*A. P.*)

Filtrable Forms of Tubercle Bacilli and Tuberculous Inheritance.—These forms have been found in cerebrospinal fluid, pus from cold abscesses, caseous lymph nodes, and macerated lungs of tuberculous children. Inoculated guinea pigs showed chiefly or entirely lesions localized to the lymphatic system. The authors advance several hypotheses relating to these forms and to the problems of heredity in the tuberculous.—*Les formes filtrantes du bacilli de Koch et le problème de l'herédité tuberculeuse, Arloing, A. Dufont and Malartre, Meeting, Soc. Méd. d. Hôp. d. Lyon, June 16, 1925, reported in Presse Méd., July 11, 1925, no. 55, 938.*—(*A. P.*)

Effect of Rain-Bearing Winds on Tuberculosis.—In India tuberculosis is least prevalent in the dry northern portion, where the rain-bearing monsoon winds do not reach, and in areas in the monsoon region that are protected by mountains. The disease is more prevalent throughout the Sub-Himalayan regions, as far as the monsoon influences the climate by producing a high absolute humidity.—*Climate and Disease Incidence in India, with Special Reference to Leprosy, Phthisis, Pneumonia and Smallpox, L. Rogers, J. State Med., November, 1925, xxxiii, 501.*— (*H. S. W.*)

Habitat in Pulmonary Tuberculosis—That damp houses and damp soil hinder recovery from pulmonary tuberculosis has long been known. Strong wind is also generally recognized as unfavorable. Places that are much shut in have been found to be undesirable. Rainy weather, adequate precautions being taken, need not act as a bar to recovery. Patients confined to bed are more comfortable and appear to make better progress in moderately cool weather and in warm weather with a gentle breeze. They dislike "muggy" weather. In sultry weather appetite fails and the tendency to fever increases. Cold, still weather is often followed by improved appetite and less fever. As regards sanatoria, places exposed to strong winds are not advisable. Places on the coast are liable to gales of wind or to sea fog. That personal exposure to strong wet winds out of doors predisposes to phthisis is too sweeping a statement. Healthy

people run less risk of becoming consumptive if they go out freely in all kinds of weather, than if they stay indoors when it is wet and windy.—*Habitat in Pulmonary Tuberculosis: a Commentary on Dr. W. Gordon's Statistics, F. R. Walters, Brit. J. Tuberc., April, 1926, xx, 77.*—(*F. M.*)

Dust Infection in Tuberculosis.—The author studied dust infection by using sprays of sputum, equalling in size of droplets those obtained upon coughing. With small amounts of material in the form of droplets, occurring on handkerchiefs, dusting-rags, clothes, and on the floor, there was a rapid, almost immediate, drying, which in most cases was complete within one hour, so that mechanical methods could raise this in the form of dust. This dust always contained a certain portion which was so fine that it could be suspended in the air. The material from linen and woolen goods, especially handkerchiefs, also formed a fine dust. The tubercle bacilli enclosed in sputum are fairly resistant to drying, and during the first 24 hours the number of living bacilli does not diminish in diffuse daylight. A diminution of virulence could not be determined within the period of 18 days' study. Guinea pigs, infected by dust obtained from clothes or material of any kind which had been brushed or beaten, developed tuberculosis in the majority of the cases, it being a primary pulmonary condition. It is concluded that dust infection must still be considered an important source of human tuberculosis.—*Weitere Untersuchungen über die Bedeutung der Staubinfektion bei der Tuberkulose, B. Lange, Ztschr. f. Hyg., 1926, cvi, 1.*—(*H. J. C.*)

Tuberculosis and Tobacco Industry.—In a community of 50,000 inhabitants in Baden, with a number of tobacco industries, the tuberculosis mortality exceeded that of the average for this State, and also that of neighboring Mannheim. The mortality was highest where the greatest number of tobacco workers resided, and lowest where these residents were at a minimum. Many of the tobacco workers are of weakly constitution, especially the men in this industry, because they enter the work when they are useless for other occupations. The high tuberculosis mortality among the tobacco workers is not attributed to the occupation, but rather to the lowered vitality of the worker who is drawn into the occupation.—*Tuberkulose und Tabakarbeit. Untersuchungen im ehemaligen Amtsbezirk Schwetzingen (Baden), Ernestine v. Müller and Berghaus, Ztschr. f. Tuber., 1926, xliv, 273.*—(*H. J. C.*)

Pulmonary Exacerbations Following Nephrectomy for Tuberculosis.—Rochet places patients in three categories: (1) those who present no pulmonary lesion, (2) those without definite pulmonary lesion but with suspicious history, and 3) those with definite active pulmonary lesions. The mortality after nephrectomy in group 1 is 4 to 5 per cent; in group 2, 10 to 15 per cent, and in group 3, 30 to 45 per cent. Miliary complications are especially to be feared, as also bone and joint lesions. General anesthesia appears to favor the activation of pulmonary processes.—*Les poussées tuberculeuses pulmonaires après nephrectomie pour tuberculose, Rochet, Meeting, Soc. d. Stomatologie, June 22, 1925, reported in Presse Méd., July 22nd, 1925, no. 58, 985.*—(*A. P.*)

Reinfection in Tuberculosis.—In many cases hematogenous reinfection is important. A case of a primary lesion in the lung of a 14-month child resulted in a submiliary seeding of the lungs and spleen. There also developed a tuberculous endarteritis, with caseous involvement of almost the entire left cerebral hemisphere. It is thought that even in the lung hematogenous reinfection frequently takes place. Because of their double circulation and the special predisposition of the pulmonary apices, the lungs are considered more suitable for hematogenous reinfection than are other organs. With reinfection of the lungs there also occurred foci in other organs. In a case of choroidal tuberculosis, which could have resulted only from hematogenous infection, repeated implantations in the lung led to cavity in the upper lobe.—*Beitrag zur Reinfektion der Tuberkulose, F. Hesse, Beitr. z. Klin. d. Tuberk., 1925, lxi, 69.*—(*H. J. C.*)

Conjugal Tuberculosis.—Among 345 cases of open tuberculosis, the consort was newly infected 15 times 4.3 per cent). The cases were divided as follows: Among 207 tuberculous men the wives became diseased 12 times 5.8 per cent), and among 138 tuberculous women the husband 3 times (2.2 per cent). The clinical picture was that of a "tertiary" tuberculosis, indicating superinfection. It was found that infection was more frequent in unfavorable home surroundings. Aside from these open cases of tuberculosis, there was a small percentage of closed tuberculosis, dry pleurisy, lupus, and others with suspicious tuberculous symptoms. While the open tuberculosis among mates was 5.8 per cent, the disease in the general population is about 0.5 per cent.—*Tuberkulose unter Ehegatten. Ein Beitrag*

zur Frage der sogenannten exogenen Reinfektion, F. Biemann, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 1.—(H. J. C.)

Bovine Bacillus and Nonpulmonary Tuberculosis.—In most instances the source of the bovine bacillus is a diseased udder. The original focus in human infection may be trifling,—a small tonsillar spot or tiny intestinal ulceration. If tonsils or adenoids are primarily involved, the cervical lymph nodes soon exhibit swelling; if the intestine, the abdominal lymph nodes. In children one of the most serious consequences is extension to bones and joints; less common, but more serious, is extension to kidneys or meninges. Two steps have been taken to make milk and meat supplies safer: (1) attempts to eliminate tuberculosis among cattle, and (2) widespread adoption of pasteurization. Milk has been the one staple article of food habitually eaten uncooked. The decline in the death-rate from pulmonary tuberculosis has been steady, whereas the death-rate from nonpulmonary tuberculosis remained practically stationary from 1872 to 1907. Since then it has dropped from 59 to 14 and should reach the vanishing point within a few years. The goal, however, cannot be reached as long as cows are "plugged" to prevent the detection of tuberculosis in the cattle market, and proper pasteurization is neglected. Dishonest and careless preparation of milk must be stopped. Meanwhile the treatment of those afflicted is essential, and Massachusetts is adopting the necessary measures.—*Nonpulmonary Tuberculosis and the profession, J. L. Stone, Boston M. & S. J., May 13, 1926, cxciv, 880.—(A. P.)*

Tubercle Bacilli in Butter.—With a view to determining the persistence of tubercle bacilli in butter made from milk known to contain them, specimens of milk were collected from 5 tuberculous cows; 3 of these cows were afterwards shown to have extensive tuberculous lesions, and in all 5 cases the presence of tubercle bacilli in the milk was demonstrated by inoculation into guinea pigs. One sample of butter made from naturally ripened milk was found to contain tubercle bacilli; the butter produced in other ways from this milk was also found to be similarly affected. The other four samples of milk, whether unheated or heated, produced butter which was free from tubercle bacilli. From this study it would appear that even the most careful pasteurization is not always a sufficient protection against the survival of tubercle bacilli.—*Persistance of Tubercle Bacilli in Butter from Tuberculous Milk, H. A. Cookson, Brit. M. J., October 9, 1926, no. 3431, 637.—(B. T. McM.)*

Miliary Tuberculosis in Premature Children.—*Case 1:* A colored girl, six to eight weeks premature, whose mother died of tuberculosis three days before the patient's death, which occurred at the age of seven weeks. There was but little fever until shortly before death. The clinical diagnosis was prematurity. Necropsy report showed caseous mediastinal and peribronchial lymph nodes, caseous pneumonia of the left lung, miliary tuberculosis of lungs, liver, spleen and kidneys. *Case 2:* A white boy, four to six weeks premature, whose mother died of tuberculosis eleven days before the patient's death, which occurred at the age of two months. For one month before death the temperature fluctuated between 99° and 103°, and the patient had diarrhea with blood and mucus in the stools. The clinical diagnosis was prematurity and dysentery. Necropsy report showed caseous mesenteric lymph nodes, with miliary tuberculosis of spleen, liver, pancreas, thyroid and kidneys, and tuberculous ulcerations of the jejunum, ileum, and colon. In neither case was a tuberculin test done because of the supposed rarity of tuberculosis in premature children. Routine use of intracutaneous tuberculin tests is urged in premature children of tuberculous mothers, in very young children who fail to gain weight on adequate diet, and in very young children with persistent and unexplained fever. In early cases of severe diarrhea, not amenable to the usual treatment, tuberculous ulceration of the intestines must be considered.—*Miliary Tuberculosis in Premature Children; Report of Two Cases, J. H. B. Grant, Am. J. Dis. Child., September, 1926, xxxii, 407.—(P. J. W.)*

Curable Forms of Active Tuberculosis in Infancy.—Tuberculosis in infancy may not only be curable at times, but also subject to the same evolutionary changes observed in older children and adults. Age itself is only a secondary matter; clinical type and manner of evolution depend upon other factors. Thanks to the authors' facilities for removing children from their tuberculous parents and placing them in the country entirely separated from further contagion, it has been possible to study the anteallergic period by means of the skin reaction and to determine fairly exactly the changes of survival of the infants. Exacerbations of pulmonary tuberculosis have been observed which, after a more or less prolonged course, retrogressed and became completely cured. The manner of behavior of the infant to-

ward tuberculous infection appeared, in a way, simplified. As in the animal, it is essentially the quantity of bacilli and the weight on the one hand, and the circumstances of infection on the other, which, causing the infection and at the same time the appearance of immunity, determine the clinical form and the evolution toward cure or death. It was in 1910 that opinion as to prognosis began to change, as an increasing percentage of survivals was reported from various sides. Bernard, Debré, and their group at the Laennec Hospital *Crêche* reported only 43.4 per cent of deaths. This surprisingly low figure was explained by the fact that at the *Crêche* the infants are separated from the parent before infection has been massive and repeated. In some of the surviving infants practically nothing but the positive skin reaction ever developed. Also the so called *forme floride*, in which the infant appears in blooming health, was encountered in 15 per cent of cases by Debré and in 32 per cent by Bernard. In still another group of survivors, and this type the authors described in this paper, there was definite clinical and radiological evidence of considerable pulmonary disease, in spite of which the infants completely recovered. Similar cases have been reported by several writers in recent years. Among 87 infants with positive skin reactions the authors found 18 active cases which became cured. They were divided as follows, from the standpoint of age: birth to six months, 2 cases; six to twelve months, 5 cases; twelve to eighteen months, 5 cases; eighteen to twenty-four months, 2 cases; twenty-four to thirty-six months, 4 cases. Most of them were more than six months of age. Under six months tuberculosis is more often fatal; over two years it frequently becomes latent. The age at the beginning of contamination was as follows: birth to six months, 6 cases; six to twelve months, 6 cases; twelve to twenty-four months, 5 cases; twenty-four to thirty-six months, 1 case. Therefore, in two-thirds of the 18 cases infection commenced during the first year, and in one-third before the sixth month, conditions regarded as definitely unfavorable. The duration of contact was in general prolonged, but affected by two factors: *1:* While prolonged, the contact was not highly infectious. Twelve of the 18 cases were exposed for more than six months, with the mother the source of contagion in all but three. On the other hand, the infecting parent was usually not a source of severe contagion. *2:* Contamination was continuous, and not interrupted, as so frequently happens in the cases in which the outcome is fatal. *Symptomatology:* There were three groups. One entered the hospital with a negative skin reaction which became positive under observation. Coincident with the reaction becoming positive, there developed low fever, loss of weight, and digestive symptoms. In 5 the symptoms were prolonged, and definite disease appeared, both clinically and radiologically. The second group had been infected for some time. They had no symptoms on admission, but developed an extension under observation. The third and largest group (10 cases) showed general and physical evidence of active pulmonary disease on admission. X-ray films made it possible to follow the progression or retrogression of the disease. In 7 cases there was a shadow at the level of the first intercostal spaces (at the base in only one case), covering at times the whole apex. This shadow was not of uniform density, but usually was spotted with darker areas. Disappearance was generally not complete, and hilum shadows remained behind, or a light shadow at the site of a former focus. *Evolution:* Despite the apparently severe general symptoms and the marked radiographic evidence, the cases for the most part went on to a cure in three to four months. In 7 cases, all primary infections, the attack was over within two months. Successive films showed the decrease in extent and ultimate disappearance of the lesions. *Prognosis:* Neither physical signs nor X-ray indicate which infant is to recover. But if the contamination has not been too prolonged or too severe, and if it is known that the anteallergic period was of long duration (more than one month), the prospect is good.—*Les formes curables de la tuberculose evolutive du nourrisson, L. Bernard and J. Paraf, Ann. d. Méd., June, 1926, xix, 638.*—(*W. B. S.*)

Infants of Tuberculous Mothers.—The *Maternité Baudelocque* has since 1921 given obstetrical care to mothers suffering from pulmonary tuberculosis; and has also made every possible effort to prevent their newborn babies from contracting the disease by maternal infection. Immediately after birth the babies are "placed out" in carefully supervised homes, where the weight, regulation of formulae, etc., can be properly looked after. Between November, 1921, and October, 1925, the *Maternité* has hospitalized 231 contagious tuberculous mothers. Eleven of these died in the clinic of their tuberculosis. Of the 101 patients entering the clinic before the first of May, 1924, and surviving gestation and delivery, 15 died during the first three months after delivery, and 23 during the fourth to twelfth months. Only 63 survived the first year. With regard to the babies, the abortion-

rate was not raised. Two hundred and nine were born living, and apparently capable of surviving. Of 151 babies weighing more than 1800 grams, without malformations or syphilis, 20 died during the first month, and 6 during the second and third months,—a mortality attributable simply to separation from their mothers and mother's milk. Such congenital debility as was observed was not noticeably greater than would have been found among any similar group of babies born of sick mothers. There is no doubting the benefit of the routine at the Baudelocque clinic, both to the mothers and to the babies, especially when we consider the fate of the latter under other circumstances. Moreover, babies who have successfully passed the dangers of the first few months, have been protected against familial contagion.—*Fonctionnement d'une maternité pour tuberculeuses annexées à la clinique Baudelocque, A. Couvelaire, Nourrisson, May 1926, xiv, 167.*—(*P. J. W.*)

Pretuberculous Child.—The term "pretuberculous," applied to the young, is vague. The term should include the "suspected tuberculosis" group. Certain features of early tuberculosis in children are mentioned. Enlargement of the bronchial lymph nodes is an important indicator of the "pretuberculous" condition. Ghon described primary pulmonary foci in children, yet, in a large proportion of cases, it is probable that the bronchial lymph nodes constitute the site of initial tuberculosis in the chest. Of clinical signs indicative of bronchial adenitis, perhaps that of D'Espine is the most valuable. Children with chronic cervical lymph-node enlargement, other definite causes excluded, might be regarded as pretuberculous when (1) there is history of tuberculous environment, (2) there are debility, underweight and chronic catarrh, and (3) there is evidence of the tuberculous disposition. A positive tuberculin reaction in a child under five years of age is of great value in determining very early tuberculosis. The following groups, it is suggested, come under the pretuberculous headings: *1:* Children with definite tuberculous family history because of the almost inevitable postnatal environmental infection. *2:* Children who have been in close contact with any case of active phthisis for a considerable period. *3:* Children who have been notably debilitated since an attack of another disease, above all, measles or pertussis. *4:* Children with suggestive symptoms, but in whom early tuberculosis cannot be diagnosed. *5:* Children with the "tuberculous disposition." There remains the type of children eligible for classification by reason of certain physical characteristics. Two broad types of conformation have been described: (1) the tuberculous, with bright eyes, oval face, thin skin, narrow nose, and long thin bones; and (2) the scrofulous, with heavy figure, thick lips, opaque skin, large hands and large thick bones. Past history of disease, measles, pertussis or catarrhal conditions, will often influence selection. In selecting pretuberculous children rigid rules cannot be laid down. A new definition of the pretuberculous child is suggested, namely, one who, by reason of tuberculous family history and contact, of past debilitating disease, or of present physical condition, is usually likely to become the victim of active tuberculous disease; in addition, the term is extended to include those children, in whom the presence of tuberculosis is already suspected, but whose condition will not admit diagnosis. In conclusion, we must look to preventive rather than to curative medicine, the hope of a decreased incidence of tuberculosis. The pretuberculous child should be removed from an environment of infection, be adequately nourished and clothed, and be subjected at the legal age to open-air schooling.—*The Pretuberculous Child, A. Massey, Brit. J. Tuberc., April, 1926, xx, 72.*—(*F. M.*)

Health Diagnosis in Children.—A child who does not exhibit some one of the specific diseases listed in medical text-books and upon whom no distinct diagnosis of illness has been made is considered well and is treated as such, although impairment of growth and development may be marked. Unless a clearly defined disorder is manifest the child is considered well, although in this realm of pseudo-health there often may lie the early stages of all the chronic conditions, including tuberculosis. The parent knows that something should be done, yet practically all that many physicians do in such a situation is to send parent and child home, to return when the condition has gone far enought to be classified as something pathological. For this reason the health problem, aside from its end result, disease, is left largely to the mercies of any one who may chance to be interested in it,—the dietitian, physical educator, social worker, teacher and others, who in a well-organized health plan would be valuable aids and adjuncts. The victim of this condition of affairs is the growing child, and back of it loom sickness and death, a morbidity and mortality that increase with the complexities of modern life. It is largely the fault of our profession that it has not been made clear that the problems are essentially medical, and that those who can deal best with them are physicians, with their neces-

sary knowledge of pathology reënforced by training in positive constructive health diagnosis and preventive medicine. The infant has been rescued from these negative, inadequate methods, still characteristic of our care of the later growing years. But after the first year of life our health intelligence fails to function, and the child is left more and more to chance. The school authorities have felt to some degree the desirability of doing something to meet the health needs of the child, but they have gone no further than to preach health to pupils who by their own efforts alone are practically helpless. A great wave of printed matter has inundated teachers, affording them general information on many aspects of living and this must be passed on to their charges. The dictum, "learning by doing," has influenced the school authorities and health organizations. One result of this is the device of the "health chore" for getting the new material over in the life of the child. For example, one large organization requires the child to perform eleven daily chores by the doing of which he may expect to become well and strong. The chores range from simple matters, such as carrying a clean handkerchief, to the more difficult one of having a bowel movement every day, although no directions are given for finding and removing causes of constipation. This is just the beginning, for there are a second, third and fourth series of chores,—something of a hygienic *cum laude*, ending with a Phi Beta Kappa which calls for eternal vigilance in such matters as neatness of appearance, personal control of ventilation, clean-mindedness, a balanced diet, reading matter held 12 inches from the eyes, and washing the hair and scalp. Another organization reduced the rules to eight, and four of these are, "sleep long hours with the windows open," "drink as much milk as possible," "drink at least four glasses of water a day" and a "bowel movement every morning." All of these are open to criticism. For example, milk should not be used to quench thirst, and the drinking of four glasses of water takes no account of how much other liquids have been taken. In an attempt to achieve the daily bowel movement without fail every day, large numbers of children form the habit of taking physics, suppositories or enemata every day of their lives in order to secure the result. Health habits are important, but the means of teaching them should be given more consideration. Testimonials from children have been published, such as this sample from a state public health association: "I wash my hair with emulsified cocoanut oil at least once a month. If you had done this, Grandpa, you would not have been baldheaded. I am never going to grow old, for I take physical exercise daily, and sit in a good position that my bones may grow properly." The New York Tuberculosis Association very properly states in its Bulletin "There is no medicine that cures tuberculosis. All medicines advertised as 'cures' are cruel frauds." Yet to tell a child, "Do this and you will be well," is equally cruel. The effect of the chore system, as now used, is to sanction expectations from certain practices which are entirely out of accord with experience and accurate knowledge. The child asks for health and he is given a medal. This is not honest treatment and amounts to betrayal of his confidence. One of the end-results of such methods is clearly seen in the reaction of the high-school boy or girl, who has reached the stage where he decides that all this health activity is "bunk," and he will have nothing to do with it. It is plain that present schemes of health "chores," "teaching health" and so forth are ill adapted to real needs and misleading in the impressions they actually make upon children. Intellectual knowledge has little or no permanent effect on health habits. The basis of a program which deals with the entire period of growth is found in the present expert system of care worked out for the first year of infancy. Adequate provision for proper growth and development requires constructive health diagnosis, which utilizes training in pathology without being overshadowed by it. A study of the results of thousands of examinations shows that the most common causes of physical unfitness, in their order of importance, are (1) physical defects, especially nasopharyngeal obstruction, (2) overfatigue, (3) inadequate home or self control, (4) faulty food and food habits, and (5) faulty health habits. A satisfactory program takes account of this state of affairs and brings into operation the force of (1) the interest of the individual, (2) the home, (3) the school or college, and (4) medical care in order to remove causes of physical unfitness, bring the individual to a point where he is free to gain, and afford him adequate training in proper health habits. Applications of this program have already resulted successfully in many communities and institutions.—*Health Diagnosis in Children, W. R. P. Emerson, Am. J. M. Sc., May, 1926, clxxi, 707.*—(*J. S. W.*)

Tuberculosis in Children.—Tuberculosis statistics, especially for childhood, reveal numerous shortcomings and points open to criticism. On the one hand the figures are too high, while on the other there is a too prevalent feeling of optimism. In numerous

children of school age and younger an erroneous diagnosis is made. With proper diagnosis there will be, to a great extent, eliminated the occurrence of meningitis out of a clear sky.—*Zur Frage der Richtzahlen bei der Kindertuberkulose, Redeker, Beitr. z. Klin. d. Tuberk., lxii, 1925, 212.*—(*H. J. C.*)

Tuberculous Infection and Disease at School Age.—In the early school periods there occurs, as a rule, superficial and bronchial lymph-node tuberculosis which, in the majority of cases, has a favorable prognosis. As the child approaches puberty the more frequent becomes the tertiary pulmonary tuberculosis, with a predominately unfavorable outcome and greater infectiousness. A delicate constitution of the school child of all ages can in no wise be taken as a measure of tuberculous infection. There is no marked difference between diseased children from definitely tuberculous surroundings and those from healthy families. The number of healthy children originating from infectious surroundings is remarkably constant. Over a 4-year period, there was noted a mortality of 26 cases out of a total of 5,200 school children.—*Über tuberkulöse Ansteckung und Erkrankung im Schulalter, F. Kreuser, Ztschr. f. Tuberk., 1926, xliv, 184.*—(*H. J. C.*)

Pirquet Reaction in Children in an Antituberculosis Dispensary.—These observations cover a recent four-year period at the tuberculosis dispensary of Molenbeek-Brussels, where routine tests were made on 930 children, using Koch's O. T. The Pirquet method was used, and results read after forty-eight hours. *1: Percentage of Positive Cutireactions at Different Ages:* No children under three years of age were tested. The percentage of positives varied from year to year, the lowest being 40 per cent at four to five years, the highest 69.5 per cent at fourteen to fifteen years, and the average for the group 54 per cent. The gradual and marked increase from year to year, noted by Hamburger and Pirquet, was not apparent, whereas the proportion of positives in children under six years was higher. This is undoubtedly accounted for by family exposure to open tuberculosis. Subtraction of those known to have been so exposed lowers markedly the percentage of positive reactors, as has been shown by Meunier. *2: Control of Negative Reactions:* Quite a large proportion (16 per cent) of originally negative reactors showed a positive reaction when the test was repeated. Subsequent family infection also appears to account for the great number of these, as only 3 per cent of those not exposed in this way showed positive on the second test. *3: Intensity of the Cutireaction:* In this study the morphological character of the reaction is emphasized rather than the exact extent of the papular area or erythema. There are recognized (1) simple erythema, reaction doubtful; (2) papular erythema, or slight reaction, quite common; (3) papulovesicular erythema, fairly strong reaction; (4) Phlyctenule or bulla, very strong, rare; and (5) pustule with central eschar, very rare. The intensity of the reaction seems to be exalted in pleurisy with effusion and bone and joint lesions, and diminished or effaced by meningitis, measles and pertussis. Second and third-degree reactions appear to be less variable than very strong or weak ones. A certain number of children who developed positive reactions while under observation were studied, and in general their reactions were less pronounced than those already positive. Children exposed to sources of infection at the time when tested showed a larger proportion of third-degree reactions; hence it is concluded that reinfections slightly increase the intensity of the cutireaction, but not invariably. *4: "Silence" of Tuberculous Infection:* With two exceptions, none of the children, observed to develop a positive reaction following a negative one (28), exhibited any symptoms of note, and increase in weight and height and general development proceeded regularly. The two exceptions developed definite intrathoracic hilar lesions. *5: Constancy of Positive Reactions:* Of 286 positive tests which were repeated one or several times, only 3 were negative. One of them had a first-degree reaction, the second became negative prior to developing pertussis, and the third was inexplicable. *6: Cutireaction and Contact with Tuberculosis:* Of 185 such exposed children, 174 gave positive reactions. The few negatives are explained on the basis of the fibroid character of the disease in those to whom they were exposed or the paucity of cough and sputum, or, in a few cases, to the adequate precautions taken by the family. *7: Relation of Positive Cutireaction to Certain Physical Signs:* A voluminous softening or suppurative adenitis was almost invariably associated with a positive cutireaction. This was not true of simple slight lymph-node swellings, which were, practically, as often nontuberculous. Likewise, the venous hum and Smith signs were found very unreliable. D'Espine's sign was only a little more frequent among positive than negative reactors. *8: Radioscopy and the Cutireaction:* Of children with a positive reaction, 59 per cent showed a normal picture, 26 per cent calcified areas, and 15 per cent hilar or mediastinal densities; of those with a negative reaction, the figures were 80 per cent, 12 per cent and

8 per cent. Thus, there is no absolutely characteristic picture of tracheobronchial adenopathy, such as was quite recently thought, and prudence should be observed in interpreting hilar and mediastinal shadows. Although lesions can undoubtedly exist without giving definite radiographic signs, they probably are not nearly as common as was recently thought. Precautions should be taken to avoid confusion with vascular and other superimposed shadows. It is also clear that other conditions than tuberculosis may give rise to scars and calcifications. *9: Physical Development of Infected and Noninfected Children:* The figures for the entire group, age by age, show no consistent difference, either in height, weight and thoracic or general development, between the infected and noninfected children. It therefore seems that "occult tuberculosis" is too often invoked to account for deficiencies due to heredity, nutrition and hygiene, intercurrent disease, etc. *Summary: 1:* A systematic study of the tuberculin cutireaction shows that positive reactions are less frequent than would be expected from the classical statistics. *2:* The intensity of the reaction seems fairly stable and only slightly influenced by reinfections. It is most rare for a once positive reaction to disappear. *3:* Children living in contact with open tuberculosis practically always give a positive reaction. *4:* Some of the commonly reputed signs of tuberculous infection are very unreliable, and radiographic abnormalities, especially about the hilum, must be interpreted with caution. *5:* Physical development appears to be practically uninfluenced by occult tuberculous infection.—*Une enquête an moyen de la cutiréaction à la tuberculine dans la clientèle infantile d'un dispensaire antituberculeux, E. Olbrechts, Rev. Belge d. l. Tuberc., July, 1925, no. 7, 177.*—(*A. P.*)

Diagnosis of Incipient Tuberculosis in Children.—Up to eleven years of age the pathology of tuberculosis in children is predominantly that of the lymph nodes; there are very few signs elicited by examining the chest of an early case of tuberculosis; there are very few subjective symptoms in children; 43 per cent of children with incipient tuberculosis were found to be either normal or overweight;—all of these facts emphasize the difficulty of making a diagnosis of this condition in children. Statistics of others are cited, indicating that the very high incidence of tuberculosis in children up to 14 years old, as found by Pirquet in Vienna, does not obtain in the less-infected communities of America. Veeder and Johnston found an incidence of 20.9 per cent for all ages up to 14. The authors also emphasize the work of C. H. Smith, indicating that the intracutaneous is twice as reliable as the Pirquet test. They believe that if one awaits the presence of physical signs in the chest and tubercle bacilli in the sputum, he will diagnose only the advanced cases, or those that have already evolved into the adult type. It is thus regrettable that the most common site of tuberculous infection should be in so obscure a location as the hilum lymph nodes. In view of the number of nontuberculous infections giving similar hilum X-ray shadows, X-ray examination is generally of little aid in the diagnosis of incipient cases. The positive D'Espine sign is probably the only important physical sign of tracheobronchial enlargement, and becomes more significant if the tuberculin test is positive also. There is not a greater incidence of tuberculous infection among the malnourished school children. The rôle that bovine infection plays has been greatly exaggerated. Sixty-four to 81 per cent of school children giving a definite history of contact become infected. Thus, a definite history of contact, X-ray evidence of enlarged tracheobronchial lymph nodes with positive D'Espine's sign, and a positive tuberculin test, are sufficient evidence to make a diagnosis of incipient tuberculosis in children.—*The Diagnosis of Incipient Tuberculosis in Children, W. H. Donnelly and H. A. Reisman, Arch. Pediat., June, 1926, xliii, 386.*—(*P. J. W.*)

Diagnosis of Hilum Tuberculosis in Children.—The almost constant presence of infection of the tracheobronchial lymph nodes in the young child, if tubercle-bacillus infection is anywhere present, and the importance of the diagnosis are generally admitted. But many of the criteria of diagnosis are still disputed; the X-ray is mistrusted and diagnosis is made only by a general study of the case. All of the commonly employed physical signs were tested by the author in 50 cases, 20 of which came to autopsy. Although experience was discouraging with the signs of Friedjung, Guéneau deMussy, Martinson, Oelsnitz, and Smith, there were two signs which were of real help: namely, d'Espine's and, still more, Genevrier's sign. The latter is an exaggerated audibility of the cardiac sounds below the clavicle and in the right axilla. In 12 autopsies with tracheobronchial adenopathy the sign accorded with the autopsy results. In 8 autopsied cases, in which the sign was negative, there was no tracheobronchial enlargement. There are two essential difficulties in the diagnosis of tracheobronchial adenopathy. These are the establishment of the fact of its existence

and the determination of the tuberculous character as well as activity of the adenopathy found. The more signs employed the more certain can one be of the diagnosis. There are several methods to help in deciding for or against the tuberculous character of the lymph-node involvement, such as serological examination, the character of the anemia, fever or cachexia, and fluoroscopy and X-ray, which may give presumptive but not certain evidence. On the other hand, the Pirquet test is of great value, particularly in young children, since it gives the essential information that a tuberculous infection is present. Finally, there is the examination of the pharyngolaryngeal mucus and of the stools for tubercle bacilli, which are indispensable examinations, since, if positive, they remove all doubts at once. When the diagnosis is established a special effort should be made to discover and eliminate the source of infection. The proper diagnosis of this condition in children, who are candidates for a summer holiday in the country, is very important, since with the aid of the visiting nurse, it may lead to the discovery and proper management of tuberculous families.—*Le diagnostic de l'adénopathie trachéobronchique tuberculeuse chez l'enfant: son importance au point de vue du traitement climatique, V. Mikulowski, Ann. d. Méd., January, 1926, xix, 67.*—(*W. B. S.*)

Pirquet, Mantoux, Ring and Tubercumet Tests in Children.—The Pirquet and Mantoux tests, though undoubtedly specific for previous infection, give no information as to the activity of the tuberculous lesion. Nor does negativity of these tests exclude tuberculosis. The ring and *Tubercumet* tests having been found positive in a high percentage of active cases, the clinical findings and the data on these four tests were obtained in 218 children at the Lymanhurst School for Tuberculous Children in Minneapolis. Sixty-five of these children (30 per cent) had negative Pirquet tests; and of these 65, the Mantoux test was positive in 7 (13 percent), the ring test in none, the *Tubercumet* in none. Of the 116 cases with positive Pirquet tests, the Mantoux was positive in 105 (96.4 per cent), the ring and *Tubercumet* in none. None of the 65 cases with negative Pirquet tests had any clinical evidence of tuberculosis. The second group (116) were diagnosed as having juvenile or hilum tuberculosis, the diagnosis being based on positive Pirquet and Mantoux reactions, roentgen-ray evidence of enlargement and calcification of bronchial lymph nodes, undernutrition, frequent colds, definite exposure to open cases of tuberculosis, and occasional elevations in temperature. The results of the four tuberculin tests indicated that these children had had a previous tuberculous infection, not active at the time the tests were applied. Acute nontuberculous infections may render the ring and *Tubercumet* tests (especially the former) temporarily positive. If such infections are excluded, however, and if the tests are persistently positive, they provide very strong evidence of active tuberculosis. Other established methods of examination must of course be given due weight.—*A Comparison of the Pirquet, Mantoux, Ring, and Tubercumet Tests in Lymanhurst Children, C. A. Stewart and A. E. Collins, Am. J. Dis. Child., September, 1926, xxxii, 367.*—(*P. J. W.*)

Pulmonary Tuberculosis in Childhood.—An attempt was made to group 102 children with definite pulmonary tuberculosis according to Ranke's stages II and III and according to age-groups 4–7, 8–11, and 12 or more years of age. The first age-group all belonged to Ranke II; in the other two groups the incidence of tertiary phthisis was 50 per cent. Children with a secondary type of tuberculosis showed usually an earlier onset of symptoms, and their disease was more frequently preceded directly by a severe infectious disease; these children presented as a rule only moderately intense physical signs and the X-ray photographs showed sometimes more shadows than the physical examination led one to expect; sometimes the opposite was true. As regards symptoms, the Ranke-II group had a much higher percentage of those patients, who, according to the usage of the Russian tuberculosis physicians, are designated as "compensated," and whose symptoms were relieved by sanatorium treatment; 87 per cent of these patients made good progress during an average stay of seven months. But the children in Ranke's third stage showed considerably more tendency to recovery than the generally accepted views on the prognosis of childhood tuberculosis would lead one to expect; 61 per cent of them left the sanatorium in "satisfactory condition" after an average sojourn of eleven months. The follow-up observations demonstrated a remarkably high resistance even in bacilli-positive cases. Productive processes and fibrosis are not unusual findings in children, particularly after the age of seven.—*Über die Besonderheiten der Lungentuberkulose im Kindesalter, W. Markuson and O. Schatalowa, Die Tuberkulose, February 10, 1926, vi, 33.*—(*M. P.*)

Primary Focus in Lung in Childhood.—Analyzing 2,740 chest roentgenograms of

children who reacted positively to tuberculin, primary foci could be demonstrated in 521, or 19.02 per cent. Of these, 77 per cent had a single and 23 per cent multiple foci. Of all these cases 57.6 per cent were girls. In 63.3 per cent of the cases the foci were found in the right lung. By far the smallest percentage was seen in the upper parts of the lung.—*Die Lokalisation des primären Herdes in der Lunge, N. H. Knüsli, Die Tuberkulose, June 25, 1926, vi, 182.—(M. P.)*

"Epituberculosis" in Childhood.—In 13 cases of epituberculous infiltration of the lung in children between 2 and 8 years of age, the history revealed only in two the possibility of family infection; the onset of the disease was frequently more or less immediately preceded by an acute infectious disease, and regularly by manifestations of exudative diathesis, such as scrofulosis, otitis media, phlyctenulae, eczema and impetigo, frequent bronchitis, angina and lymph-node swellings. The pathogenesis of epituberculous infiltration is explained by the evident tendency of the body to exudative inflammatory processes, which is characteristic of the constitutional exudative diathesis, modifying the response of the body to a local tuberculous infection of the lung. The disease was associated in most of the cases with irregular low-grade fever. The clinical signs were those of diffuse and dense infiltration, which regularly receded first from the peripheral parts. The disease has a definitely favorable prognosis.—*Zur Frage der "Epituberkulose" im Kindesalter, M. Neumann, Die Tuberkulose, 1926, vi, 185.—(M. P.)*

Tuberculous Infection of Tonsils in Childhood.—Primary tuberculosis of the tonsil is rare. Tonsillar infection follows a primary as well as a secondary localization. In the latter case there is an associated cervical lymph-node infection. The end-result of a tonsillar infection is frequently a rupture of the tuberculous lymph node into the blood-stream, and usually from the site of a deep cervical node lying along the internal jugular vein. A case of this type is described. This descending spread is to be distinguished from an ascending spread along the lymphogenous channels from a primary pulmonary phthisis, beginning with a primary "affect" in the lung with subsequent disease of the tracheobronchial lymph nodes. In this case there may also be a rupture into the blood-stream in the vicinity of the arch of the innominate vein. Two cases of this are described.—*Über die Unterschiede im pathologisch-anatomischen Bilde primärer Tonsillen- und primärer Lungeninfektion bei der Phthise der Kinder, C. Ruf, Beitr. z. Klin. d. Tuberk., 1925, lxii, 286.—(H. J. C.)*

Amyloid in Childhood Tuberculosis.—Among 90 cases of open phthisis in children there were 78 per cent found with amyloidosis, while among 450 cases of surgical tuberculosis examined during a period of 5 years there were only 5 cases of amyloid (1.1 per cent). A disposition to amyloid in childhood is believed to be slight.—*Die Amyloiddegeneration bei kindlicher Tuberkulose, M. Neumann, Beitr. z. Klin. d. Tuberk., 1925, lxii, 274.—(H. J. C.)*

Bronchitis in Children Due to Heliotherapy.—In the heliotherapy of tuberculosis in children it is not possible to follow set rules. The course of treatment must be modified according to the constitution of the child and its susceptibility to light. It has recently been found that blond children of the type showing the exudative diathesis not only develop severe erythema without pigmentation, but are also prone to develop bronchitis as a result of overdosage with sun's rays. It is believed that protein destruction within the body, following radiation, results in the liberation of compounds irritating to the mucous membranes. Lipoids also may be concerned. Certain ash-blond children without exudative diathesis have a good prognosis as respects surgical tuberculosis, and can stand several hours of radiation without harm.—*"Sonnenbronchitis" bei exsudativen Kindern, K. Klare, München. med. Wchnschr., August 27, 1926, lxxiii, 1440.—(E. R. L.)*

Treatment of Chronic Respiratory Infections in Children.—Of the general measures, three stand out as of paramount value, namely, rest, hygiene and nutrition. A poor fourth is drugs. Indications for rest are fever and weakness or fatigue. Fever robs the child of its appetite, hastens its metabolism, prevents a gain in weight and depresses the child. The second measure is proper hygiene; fresh air, sunlight and other forms of radiant energy are helpful. Nutrition is important. It is not so much a question of good food but conditions that will make the child eat. Rest in bed often brings back the appetite. The indication for opium is not so much to cure the cough directly as to relieve the patient and give him rest. In both the irritative nonproductive coughs and in those with abundant discharge, steam inhalations, impregnated with some soothing substance like compound tincture of benzoin, may be given. Vaccines should be restricted to a very narrow field. In patients

with chronic infections it is important to prevent upper respiratory infections, avoiding contact with infected persons and removing the adenoids if they are causing any symptoms. Climatic treatment is important in cases of bronchial asthma. Lung abscess and bronchiectasis which fails to respond to postural treatment should be considered for bronchoscopic treatment. Chronic nondraining empyema in an older child is considered as a surgical disease.—*Medical Treatment of Chronic Non-specific Infections of Lungs and Bronchi in Children, J. Brennemann, J. Am. M. Ass., September 11, 1926, lxxxvii, 801.*—(*W. W.*)

Effect of Exercise on Blood of Tuberculous Children.—A study was made of the blood of tuberculous children before and after exercise, which included running, jumping, and throwing stones, the javelin and the discus. The exercise was carried out between 11:15 A.M. and 12 M.; and blood examinations, consisting of determination of the sedimentation reaction and total and differential leucocyte counts, were made several times during the day. Exercise brought about no significant change in the sedimentation reaction. As a rule, it led to a neutrophilic leucocytosis, the increase ranging from 600 to 3,900 cells, and averaging more in girls than boys. In one boy, characterized as of the "cerebral" physical type, a decrease occurred. The most marked increases took place in a child with exudative tuberculous peritonitis and in one with hilum tuberculosis. In about two-thirds of the cases with neutrophilic leucocytosis a monocytosis also occurred. In general, the changes observed following exercise were similar to those occurring after other stimulating therapy, such as radiation with sunlight or roentgen ray, injection of foreign protein, or silicic acid preparations.—*Leibesübungen, eine Reiztherapie der kindlichen Tuberkulose. Blutuntersuchungen, H. Reifenberg, München. med. Wchnschr., November 27, 1925, lxxii, 2055.*—(*E. R. L.*)

Transmission of Human Tuberculosis to Dog.—The human origin of tuberculosis of the dog and cat, and the resulting dangers of family infection are well known. The unity of the two types of tuberculosis is indisputable. Lesions of caseous pneumonia with cavities were produced experimentally in dogs by infecting them through endobronchial and transthoracic routes, and sputum rich in tubercle bacilli was obtained. The lesions were similar to those of human pulmonary tuberculosis.—*Expériences de transmission de la tuberculose humaine au chien, G. Petit, L. Larrisset and M. P. Kfouri, Meeting, Soc. de Pathologie Comparée de Paris, July 7, 1925, reported in Presse Méd., August 12, 1925, no. 64, 1082.*—(*E. H. K.*)

Tuberculosis in Dogs Caused by Non-Cultivatable Acid-Fast Bacilli.—A case of tuberculosis in a dog is recorded, which produced a thickened omentum with lymph nodes like cartilage. In the tuberculous tissues there were large numbers of acid-fast bacilli, which would not grow on the different media tried. The material was pathogenic for other animals, but pathogenicity declined with successive passages through animals.—*Hundentuberkulose mit einem nichtzüchtbaren Virus, K. Lanken, Beitr. z. Klin. d. Tuberk., 1926, lxii, 709.*—(*H. J. C.*)

Tuberculosis in Man during Various Ages.—The healing of thoracic tuberculosis increases with age. Healed primary intestinal or mesenteric lymph-node tuberculosis is rare in old age. The localization of the original primary affect in old age is the same as in younger individuals. The location of the original primary affect in unchanged lung tissue is not the rule in old age, but the exception. The elastic fibres of the original primary affect are more frequently destroyed than in the younger age-periods. The fibrous capsule of the original primary affect is well formed in old age. The lymph-node component of the healed thoracic original primary complex in old age cannot be differentiated from that of middle age. Total calcification is rare, while partial calcification or the presence of only fibrous tubercles is common. The primary affects originating in old age are frequently multiple, and the regional lymph-node involvement is slight. Reinfections in the higher age-periods are mostly multiple; they occur in the middle parts of the upper lobe rather than in the apices, as in middle age. The thoracic lymph nodes in the reinfection of old age are only slightly involved, and frequently not at all. The spread of pulmonary tuberculosis in old age is predominantly bronchogenic; hematogenous dissemination is not so constant as in earlier age-periods. Only in cases in which there is no hematogenous seeding can the designation *isolated pulmonary tuberculosis* be used. Tuberculosis of the serous membranes is unusually common in old age, and it occurs mainly metastatically along the lymph or blood channels. Secondary laryngeal and intestinal tuberculosis increase with advancing age; the tonsils are more rarely attacked than in the earlier age-periods. The peculiarities of old-age tuberculosis

stands in no relation to immunological factors. The age of the individual is of great significance in tuberculosis.—*Die Tuberkulose des Menschen in den verschiedenen Lebensaltern. III & IV. Mitt., W. Blumenberg, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 13.*—(*H. J. C.*)

Pathology of Tuberculosis in Childhood and at Puberty.—Study of a large autopsy material, covering the period of 1906–1923, and classified according to the age-grouping, indicated that the primary complex in thoracic tuberculosis was of little significance in puberty as compared with infants and young children. The most frequent form in puberty is chronic pulmonary tuberculosis with involvement of the local lymph nodes by recent tubercles. Healed tuberculosis is rare. In some cases the structure and location of the primary "affect" is exactly indicated, being mostly solitary, frequently in the upper part of the hilum, close to the pleura, and appearing as a localized caseous hepatization without tubercle, and in late childhood frequently located apically. In almost one-half of the cases in infancy there were cavities. Indurative changes, as an expression of chronicity, appeared first in the second age-period and occurred in 75 per cent of the pulmonary changes at the end of school-age. The compact caseated hilum lymph nodes of infancy and childhood were changed in later periods to only partial caseation or later tubercles. Ascending infection of the cervical from the tracheobronchial lymph nodes is just as rare as the reverse process. Tuberculous meningitis, as part of generalized miliary tuberculosis, is rare in infancy, but increases with age. How far the primary "affect" heals, or progresses with increase of age, could not be determined. The frequency of secondary alimentary tuberculosis is about equal for all the age-periods of childhood, being about 40 to 50 per cent. There is a primary mesenteric lymph-node tuberculosis. Mesenteric node tuberculosis is rarely fatal in childhood, but tends to heal and calcify. The primary "affect" in the intestine is mostly multiple, and is frequent in the lower ileum or cecum.—*Die Tuberkulose des Menschen in den verschiedenen Lebensaltern auf Grund anatomischer Untersuchungen, W. Blumenberg, Beitr. z. Klin. d. Tuberk., 1925, lxii, 532.*—(*H. J. C.*)

Pathology of Tuberculosis in Middle Age.—In the middle aged the thoracic primary "affect" is found mostly in the right upper lobe as foci of pinhead to lentil size and frequently calcified, or as smooth-walled cavities. The lymph-node involvement is less extensive than in the fresh primary "affect" of childhood. Since completely calcified hilum lymph nodes belong to the primary "affect," their presence is against the date of first infection as having been in early childhood. Further conclusions as to the period of first infection could not be drawn. Cavities are frequently sources of reinfection. In frequent cases without determinable primary "affect" the pulmonary and lymph-node findings do not differ from those of determinable residua of first infection. In bronchogenically disseminated tuberculosis of middle age, the lymph nodes become diseased only in the form of late tubercles. The exceptional cases of extensive caseation of the lymph nodes in the adult showed themselves, in their configuration, as independent from previous first infection. Tuberculosis of middle age is not the second or third stage of a disease originating in childhood, but a separate form in the cycle of human tuberculosis.—*Die Tuberkulose des Menschen in den verschiedenen Lebensaltern auf Grund anatomischer Untersuchungen. II. Mitt. Die Tuberkulose des mittleren Lebensalters, W. Blumenberg, Beitr. z. Klin. d. Tuberk., 1926, lxii, 711.*—(*H. J. C.*)

Tuberculosis of Old Age.—Since, in tuberculosis of old age, there frequently occur intestinal disturbances preceding marasmus, and there is but slight tendency to elevations of temperature, and percussion and auscultation changes are only of limited value because of other common changes in the thorax and lungs, the X-ray picture assumes important diagnostic significance. The blood picture also is of significance, in spite of the commonly diminished hemoglobin and the relative increase of cells and leucocytosis. The leucocytes and the red-cell sedimentation reaction are characteristic for tuberculosis in old age; and a diminution of the erythrocytes, to which may be added a distinctly decreased blood pressure, denote an unfavorable prognosis. The commonly reported atypical localization was not verified.—*Über Alterstuberkulose, W. Alwens, Beitr. z. Klin. d. Tuberk., 1925, lxii, 334.*—(*H. J. C.*)

Retrogressive Pulmonary Tuberculosis in Adults.—In the examination of a large number of benefit-society patients, there were found, in 31 adults, transient pulmonary processes running a course similar to the infiltrations of secondary tuberculosis in children. Subjective symptoms occurred, as a rule, only in the early days. Clinically, there was little determin-

able. Roentgenologically, there were found a few shadows, emanating from a denser nucleus into the lung tissue, and usually lying centralward in the pulmonary tissues. These pulmonary processes are mostly completely resorbed, and, more rarely, transformed into fibrosis, necrosis or generalized diseases. Frequently these infiltrations are diagnosed as influenza. Besides these there were found superficial pleurisies, pleural adhesions, and intralobar exudates. Etiologically, the condition is primarily a superinfection. The source of infection in most cases was in the family in working surroundings.—*Rückbildungsfähige Formen der sekundären Lungentuberkulose (Infiltrierungen) bei Erwachsenen, F. Fassbender, Ztschr. f. Tuberk., 1925, xliv, 35.*—(*H. J. C.*)

Epituberculous Infiltration of Lung in Adults.—The frequently described epituberculous infiltration of primary and secondary pulmonary tuberculosis in children also occurs in adults. Two cases are described, one 18 and the other 24 years of age. Roentgenologically, the findings at the beginning were those of nonspecific pneumonia, and in both cases there developed a "tertiary," open pulmonary tuberculosis, in one after eleven and the other after twenty-two months.—*Über zwei Fälle von epituberkulöser Infiltration der Lunge bei Erwachsenen, M. Schevki, Beitr. z. Klin. d. Tuberk., 1925, lxi, 629.*—(*H. J. C.*)

Anatomical Features of Ranke's Primary Complex.—In a series of 1,000 autopsies on the material of a general hospital (ages 4½ weeks to 91 years) strict evidence for tuberculous lesions was found in 88.9 per cent, the incidence increasing with age from 57.95 per cent in the age-group 0–18 years to 97.56 per cent in the age group 81–91. The characteristic findings of a primary lesion as defined by Ghon, Albrecht and Ranke were found in 96.17 per cent of all the individuals with anatomical tuberculosis. But the author expresses his belief that, although a particularly thorough study was made on the 34 cases in which a primary focus could not be demonstrated, this was only due to technical difficulties, several of which are discussed in detail, such as unusual and inaccessible localization, very small size and disappearance of the whole primary complex with ulcerations in the lung. In 91.69 per cent of all cases with demonstrable primary complex it was single; in 84.68 per cent there was a pulmonary focus; in 19.99 per cent an extrapulmonary focus, the majority of the latter being found in the intestines and their regional lymph nodes and some in the lymphatic region of the neck and axilla. As to the character of the lymph nodes pertaining to the primary complex, the author found in all age-groups less than 1 per cent which did not show caseation or further retrogressive changes. Frank caseation is definitely less frequent with increasing age, whereas the incidence of calcification increased from 26 to 90 per cent in the various age-groups. Obstructed lymph channels hardly ever account for the absence of the primary lymph-node focus. How long does it take for a tuberculous lymph gland to become calcified? The author's youngest case showing well developed calcification was nine and one-half months of age (Geipel reported a case six months of age). On the other hand, it is possible for tuberculous lymph nodes to remain in a state of caseation for as long as four years (one of Schürmann's cases.) It is obvious from these data that it is impossible to judge the age of a lesion on merely anatomical evidence. In a small percentage of cases the single lymph-node foci were of apparently different ages, a phenomenon that has variously been named "lymphoglandular exacerbation" or "lymphoglandular endogenous reinfection." In these cases there are no recent tuberculous lesions demonstrable in the region drained by the lymph node, which should account for the younger lesions in such nodes. Although Schürmann found in his studies some evidence for the conception that the extent of the primary focus has some bearing on the degree of immunization, he thinks that its mere size is by no means an accurate measure for the specific resistance which it produces. In 324 bodies a primary focus was the only demonstrable tuberculous lesion. Does the anatomical appearance allow of differentiation with certainty between the primary complex and any post-primary lesion? Schürmann distinguishes between occasional nonprogressive "reinfection foci" (Puhl) or "additional foci" and genuine phthisis. The following tabulation attempts an abstract of the chief differentiating points. Schürmann emphasizes that caseating processes in the lymph nodes, as a result of a genuine tertiary phthisis, occur practically only in pneumonic processes, frequently accompanied by a fibrinous tuberculous pleurisy. The frequent purely exudative end-stage of tertiary phthisis has been named the fourth stage (Koch, Obendorfer, Pagel); Ranke explains it on the basis of a paradoxical toxin hypersensitiveness in a state of high-grade immunity, in analogy to Behring's experiences with toxin hypersensitiveness in hyperimmunized animals (tetanus or diphtheria). The tabulation shows that no

	PRIMARY FOCUS	ADDITIONAL FOCI	GENUINE PHTHISIS
Localization	More frequently in lower and middle parts	More frequently in middle and upper parts and apex	Apical-caudal development
Appearance	Subpleural; great majority calcified after primary caseation	Intrapulmonary; great majority caseated	The well known varieties of pulmonary tuberculosis
Size	Seldom larger than a peppercorn	Usually larger	
Capsule	Inner specific; outer nonspecific	Usually stronger fibrous capsule	
Regional lymph nodes.	Extensive caseation of the glandular tissue, very much greater than the primary focus; outline even, rather round; definite capsule-formation; frequently calcified	No macroscopically demonstrable disease	Only slightly diseased; tubercle formation without macroscopic caseation; if present, jagged in outline because due to indirect caseation, i.e., caseation of tubercles, not of glandular tissue; no noticeable capsule-formation

absolute distinguishing marks exist, strictly pathognomonic for the primary complex only. But it is even more difficult, and at times impossible, to distinguish the primary complex from lesions belonging fundamentally to Ranke's second-stage (hematogenous metastases), especially if the process of generalization occurs without a definite time interval between the primary infection and the development of blood-borne metastases. Schürmann believes, furthermore, that a reinfection occurring a long time after the healing of the primary complex, may give rise to a second anatomically typical "primary complex." In the attempt to base the anatomical diagnosis "primary complex" on all available evidence, Schürmann finds that it was possible to come to a definite conclusion in 85 to 95 per cent of the cases in his material. "The pathognomy of the primary complex is not complete, but of such a high degree that the characteristics of the primary complex must be considered as a practically useful instrument for the genetic analysis of the postmortem picture." Besides his own work Schürmann gives a very detailed analysis, covering 112 pages, of the literature pertaining to his topic.—*Der Primärkomplex Rankes unter den anatomischen Erscheinungsformen der Tuberkulose, P. Schürmann, Virchow's Arch. f. pathol. Anat. u. Physiol., 1926, ccix, 664.*—(*M. P.*)

Site of Primary Complex and its Relation to "Tertiary" Phthisis.—The results of a study of 6,028 X-ray pictures in the Freiburg Medical Clinic, for the determination of the primary complex of phthisis, in order to note the localization, frequency and spread of primary phthisis, as well as the relation between primary and tertiary phthisis, are reported. In all probability the typical shadows of calcified lymph nodes are to be viewed as remnants of primary phthisis. Residual primary phthisis is more frequent among women than among men. The greater the primary complex overcome, the greater appears to be the relative immunity developed from it. The distribution of the primary pulmonary foci over the individual lobes or fields is dependent upon the extent of the affected pulmonary area.—*Der Sitz des phthisischen Primärkomplexes und seine Beziehungen zur tertiären Phthise, V. Wuckerpfennig, Beitr. z. Klin. d. Tuberk., 1925, lxi, 122.*—(*H. J. C.*)

Lobulitis, as Primary Lesion in Pulmonary Tuberculosis.—A particularly careful study of X-ray photographs of the lungs discloses many interesting features.

The descriptions here given are of positive pictures, some of which are reproduced with the article. *1:* There are the bronchovascular markings, which are the finest details visible in the radiograph. Lobules, acini and cellular elements are invisible when the lung is normal. *2:* When general miliary disease is present, the bronchial branchings disappear completely; the whole field of the picture is studded with numerous small shadows surrounded by little transparent spaces. *3:* When there is a pneumonic or bronchopneumonic process in the lung (lesions of bronchoalveolar origin) the bronchovascular arborizations again disappear completely, and more complex images are seen, corresponding to the projection of the different elements of the lobules, which are thickened and infiltrated by inflammatory products. The shadows most often have the appearance of small wheels, about 1 cm. in diameter, composed of a dark central point from which radiate four or five shadow spokes delimiting clear spaces between them. At times only the small spaces are to be seen, confluent, superimposed, or very near one another. The small image in the form of a wheel represents precisely the projection of the base of the lobular pyramid; the central point corresponds to the intralobular bronchus, whose direction is perpendicular to the surface of the lung; the spokes represent the oblique projection of the last terminal bronchioles, extending laterally from the central intralobular bronchus; the small clear spaces correspond to the primary lobules; finally, the circular or polyhedral contour results from the interlobular space. As long as air is still in the primary lobules, the spaces surrounding the terminal bronchioles remain clear. When there is exudate in the lobule, the latter becomes completely opaque, and is marked by a black shadow, darker in the centre than at the periphery. At times, one space remains clear when the others are obscure. Finally, when the infiltrated lobule has undergone softening and caseation, there is a honeycombed effect, and one even of very small cavities, whose outlines still show very plainly the markings of the destroyed lobular components. These different pictures are never encountered in the normal lung skiagraph. At times they are found either diffuse or isolated in a field which at first sight appears normal. They permit, therefore, of the recognition of discrete lesions which escape superficial examination. On the other hand, one sees now and then much accentuated bronchovascular arborizations (notably in bronchiectasis) without any of the small pictures herewith described. This fact enables one to exclude tuberculosis. One very important fact is that the lobular pictures may completely disappear in the case of cure by resolution; then the fine bronchovascular markings, which had temporarily disappeared, are again observed in the X-ray picture. The author states that he has often examined the lungs of children from four to seven years of age, after croup or whooping-cough, or even children affected with typical tuberculosis of the tracheobronchial lymph nodes, in order to find, by X-ray evidence, the primary infection in the pulmonary parenchyma. In these cases he was never able to see the picture of the nodule, or of a small cavity, or a caseous or ulcerative lesion. On the other hand, he very often finds one or two of the small lobular pictures. Such a lesion, in so far as it might be the primary lesion, might pass unobserved and disappear, without leaving any trace other than a latent lymphatic infection. The author thinks, therefore, that if one accepts that tuberculosis always results from a primary lesion in the lung parenchyma, there should be substituted, at least for the idea of an ulcerative lesion, the notion of a lobulitis and a small inflammatory lesion as the primary infection.—*La lobulite tuberculeuse, Lésion primaire, Jaquerod, Ann. d. Méd., January, 1926, xix, 58.*—*(W. B. S.)*

Peculiar Form of Focus of Probable Superinfection in Lung.—A peculiar apical cavity is described, in which one-half was completely emptied and the other half filled with calcified areas. Histological examination indicated that the calcified area represented a focus surrounded by a separate capsule, while the emptied cavity was another separate focus of superinfection which had completely healed and was empty.—*Über eine Eigentümliche Erscheinungsform des mutmässlichen "Super-infektionsherdes" der Lunge vei Tuberkulose, W. Pagel, Beitr. z. Klin. d. Tuberk., 1925, lxii, 614.*—*(H. J. C.)*

Localization of Tuberculosis.—The preferred tuberculous involvement of certain groups of organs is believed to be associated with the embryogenetic relations of the individual organ. The special susceptibility of the mesenchymal organs (lymph nodes, bones, serous membranes, and urogenital system) in childhood, the endodermal tissues after puberty (lung, larynx and intestines), and the change of localization of the disease in old age are to be correlated with endocrine phenomena. Likewise the prognostically favorable or unfavorable course of pulmonary tuberculosis is related to the localiza-

tion of the disease in other organs. Coincident ectodermal involvement (skin and eye) influences the pulmonary changes, so that they are of a favorable nature and inactive, and tuberculous mesenchymal organs also give rise to a definite though weaker resistance in the lung.—*Über die Lokalisation der Tuberkulose, A. Sternberg, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 106.*—(*H. J. C.*)

Explanation of Apical Localization.—The most important physical factor in the apical localization of tuberculosis is to be sought in the fact that the apex, as the result of absence of muscular or bony protection, is the only part of the lung which is not compressed during expiration, but is distended. The markedly compressed lung during cough becomes distended toward the apex, and the more markedly so the more flaccid the tissues and the deeper sunken the upper aperture happens to be (*habitus phthisicus*). Coughing is held responsible for the spread of bacilli and more frequent trauma, which lead to the preponderance of disease at the apices.—*Wodurch wird die Ansiedlung der Tuberkelbacillen in der Lungenspitze bewirkt? M. Jaeger, Beitr. z. Klin. d. Tuberk., 1925, lxi, 698.*—(*H. J. C.*)

Tuberculous and Sclerotic Apical Lesions.—For twenty years certain clinical conceptions have prevailed, especially in France, following Grancher's work, with regard to the auscultatory signs of early apical lesions and their interpretation. Such signs consist of perceptible alteration in the vesicular murmur, without adventitous signs, in the supraclavicular and supraspinous regions, such as harsh, rough or feeble respiration, perhaps accompanied by alteration in pitch, timbre, force or rhythm; the inspiratory phase is particularly affected. These modifications may be reduced to such a fine point as to be hardly discernible or open to question. Grancher himself realized that subjects presenting such signs were not always sick, and introduced the conception of a latent period or phase of the disease. This is really not a period but a stage, which may remain indefinitely without the appearance of manifest disease. Today our efforts are not so much directed toward early diagnosis as toward the verification of the tuberculous origin or nature of the pathological changes. It must be admitted that the signs mentioned do not always indicate a tuberculous lung lesion; nor even in all cases any organic lesion. To be legitimately attributed to a lesion of the lung parenchyma they must be checked by other findings, of which the most important are the roentgenographic. It is only lesions of apical pleurisy which give definite physical signs without accompanying X-ray changes. The history is also of great importance. Of particular significance are such episodes as hemoptyses, attacks of pleurisy, febrile attacks, and prolonged family contact. The presence of tubercle bacilli in the sputum is unusual or inconstant in the case of such early lesions. Fluoroscopy is inexact and its findings may be deceptive, the lung fields appearing clear when the radiographic picture is distinctly abnormal; on the other hand, it may reveal discrete patches or densities due to disease, usually accompanied by accentuated linear markings. Abnormal hila may also be discerned, but much less clearly than in the roentgenogram. Among the principal roentgenographic changes are (1) diminished transparence of one pulmonary field; (2) an accentuated network or tracing of linear shadows, which seem to radiate from the perihilar region, while the descending trunks are usually if not always involved, either alone or in conjunction with others; (3) linear or reticulated shadows, interspersed with patchy densities which are often to be interpreted as areas of calcified tubercle; (4) fan-shaped areas, pointing toward the hilum, and (5) enlarged hilar shadows, perhaps dense masses. Although one never sees at adult necropsies the large caseous masses so common in children, calcified, infiltrated and sclerosed areas are fairly common. Some radiologists rightly enjoin prudence in the interpretation of perihilar shadows, and there is undoubtedly an ill-defined border-line zone between the normal and pathological; however, when certain appearances definitely abnormal are confined to one pulmonary field, their origin can scarcely be vascular. Postmortem pathological studies would be of great assistance, but the subjects in whom these changes occur do not die of them, and we must rely on our general knowledge of the tuberculous processes to explain them. In the clinicopathological domain the works of Tripier, Bard, Dumarest, Gastinel and Jacob have demonstrated the relation between dense bronchial arborizations and peribronchial and bronchopulmonary sclerosis. As a rule the stethoscopic signs are apparent only at the apices, while the radiographic findings are much more widespread. It is now generally believed that abnormal apical signs do not usually indicate early or germinating lesions, as formerly thought, but terminal sclerosis which on X-ray is found to be associated with other pathological changes. Why such widespread lesions are perceived by the ear only

at the apices is another matter. The most simple reason is that of topographical distance, emphasized by Sergent. Perihilar and basal lesions, by reason of their location, are very often mute. It is probable that this peribronchial fibrosis, which may not denote any active lesion, develops in a sort of secondary period or stage after the primary infection. Some of these subjects actually show no stethoscopic signs, and only rarely does bacillary sputum occur. Nevertheless, there may be a bacillary intoxication, with functional or general symptoms. The distinction between active and inactive lesions is to be sought rather in the clinical history than the physical signs. There are intermediary forms which show intermittent activity.—*Sommets tuberculeux et sclêroses pulmonaires non évolutives, L. Bernard, D. Potter and M. Thomas, Presse Méd., July 11, 1925, no. 55, 929.*—(*A. P.*)

Propagation of Tuberculosis in Lung.—The first infection may take place in the lung, in the intestines or in the upper respiratory or digestive tract. The pulmonary localization is by far the most frequent one. Wherever the first infection becomes implanted, the typical primary complex develops, involving the regional lymph nodes, such as hilum, mesenteric or deep cervical nodes. The primary focus may be completely resorbed, it may heal by capsule formation, or it may spread the infection either by direct growth or by dissemination. The development of the disease follows set rules only during the development of the primary complex. The further spread, designated *generalization* by authors, does not show any regularity either anatomically or immunologically. Manifestations, called secondary by Ranke and his school, may immediately succeed the primary complex; or so called tertiary forms may follow without the intervention of a secondary stage. At any time the disease may spread by continuity, or by lymphogenous, hematogenous or intracanalicular dissemination. If generalization follows the primary infection without a period of latency it is likely to be very malignant, although, pathologically, it is by no means a purely exudative process. A generalization during adolescence tends to benign infiltrations, and definite perifocal inflammations which are frequently completely resorbed. The so called tertiary phthisis is a relatively benign processs with protracted course, frequently interrupted by exacerbations of the "secondary type." During this disease every possible mode of spread may occur. The identification of the "secondary stage" with hematogenous propagation, exudative processes, circumfocal inflammation and anaphylactic type of allergy, and of the "third stage" with predominantly intracanalicular spread, productive lesions and increasing immunity as formulated by Ranke, is not justified, since the clinical facts reveal regularly a most intimate and inseparable association of the two phenomena.—*Gedanken über die Verbreitung der Tuberkulose im Organismus vom Standpunkt des Klinikers, O. Ziegler and W. Curschmann, Die Tuberkulose, 1926, vi, 151.*—(*M. P.*)

Morphology and Propagation of Pulmonary Tuberculosis.—The relation of tuberculosis of the cervical lymph nodes to tuberculosis of the lung is not sufficiently known; whether the former constitute a predisposing or rather an immunizing factor could be decided only by a reliable statistical study for which sufficient data are not available at the present time. Aerogenous foci in the lung show a predilection for peribronchial, perivascular or subpleural localization; that is, places where the respiratory movements of the alveoli are limited by more rigid structure. Intracanalicular propagation may take place either from cranial to caudal parts, or in the reverse order. When the tracheobronchial lymph nodes are infected, there is almost invariably an earlier pulmonary focus demonstrable. From these lymph nodes a retrograde lymphogenous propagation may reach abdominal and retroperitoneal organs, thoracic wall, mamma, axillary and deeper cervical lymph nodes, but apparently not the intestines or the mesenteric lymph nodes. Tuberculosis of the bronchi without involvement of the pulmonary parenchyma does occur, but it is extremely rare; it is often found with a pulmonary tuberculosis. The perifocal inflammation around caseous centres, which has been described as characteristic of the so called secondary stage by Ranke and others, is not an "exudative allergy" but is due to the diffusion of soluble toxins. An anatomical or histological differentiation of Ranke's three stages cannot be made, because there is no morphological sign which allows of determining the age of a lesion; a calcareous focus may be older than a caseous one. There is no proof for the supposition that the degree of sensitiveness against tuberculin is in any way a measure of the sensitiveness of the tissue against the bacillus. For these reasons the concept of "tissue allergies" changing in the various stages is deemed unproved. A classification must take into account both anatomical and histological criteria. In cases of an acute and massive hematogenous propagation, when the viru-

lence of the bacilli is high in relation to the body's resistance, a generalized hematogenous miliary necrosis ensues; one finds miliary necrotic foci with pronounced collateral inflammation and severe toxic symptoms.—*Klinische Gruppierung und Verlauf der Lungentuberkulose nach morphologischen Masstabe mit Berücksichtigung der Verbreitungswege, N. P. Tendeloo, Die Tuberkulose, 1926, vi, 145.*—(*M. P.*)

Methods of Progression of Pulmonary Tuberculosis.—Forty-eight cases were tabulated, and in 69 per cent pulmonary changes were found without the presence of primary complexes, and in 16 per cent there was isolated pleurisy. Of these, 46 per cent were bilateral, disseminated, small foci, and 29 per cent disseminated and with monolateral apicocaudal spread. Seventy-five per cent are viewed as of hematogenous origin, while 25 per cent ran a purely apicocaudal course. The absence of metastases, the existence of apicocaudal tuberculosis, and the determination of an almost completely calcified primary complex constitute no absolute criterion of tertiary phthisis. The apicocaudal spread of pulmonary tuberculosis, which develops as typically scattered focal changes, belongs to the secondary stage (that of progressive generalization), provided hypersensitiveness has not fallen to its level in the tertiary phase. Purely apicocaudal tuberculosis can belong to the stage of generalization. As an example may be seen the many subacute and chronic extensively involved cases of tuberculosis which make up the larger part of sanatorium patients. Chronic disseminated tuberculosis more frequently runs the course of a chronic bronchitis with shortness of breath.—*Beiträge zur Klinik der progressiven Durchseuchungsperiode bei der Tuberkulose, K. Diehl, Beitr. z. Klin. d. Tuberk., 1925, lxii, 356.*—(*H. J. C.*)

Bronchiolitis Tuberculosa.—*Bronchiolitis tuberculosa* usually develops upon a chronic tuberculosis, leads to dyspnoea and high fever, and terminates in a few days. There occurs a fibrinous exudate involving the respiratory bronchioles and alveoli, together with a pneumonia. It is believed to be caused by the aspiration of tuberculous material. A case is described.—*Ein Fall von Bronchiolitis tuberculosa, F. Feyrter, Beitr. z. Klin. d. Tuberk., 1925, lxii, 481.*—(*H. J. C.*)

Elasticity of Arteries in Tuberculosis.—In spite of a large literature on the elasticity of arteries the subject is full of misunderstandings and contradictions. Much of the variation in result is due to lack of uniformity in method of determination. Hochrein confirmed the results of O. Frank for the coefficient of arterial elasticity. A ring cut from the descending aorta was subjected to increasing tension up to the point of rupture. When the percentage increase in length was plotted on the abscissa of an ordinary graph and the increase in tension on the ordinate, a curve was produced at first concave toward the ordinate and later toward the abscissa. The type of curve was the same in all of 45 cases studied, in which the vascular system was normal, although the elasticity modulus increased with the age of the subject. Tests on various blood vessels in 6 cases showed that the elasticity modulus increases with the distance of the vessel from the heart. In a study of 150 cases of tuberculosis Hochrein confirmed the usual finding of a low blood-pressure. No correlation could be established between the blood-pressure and the type and course of tuberculosis. The arterial elasticity was determined in 17 cases of tuberculosis, which were well studied clinically and later came to necropsy. In 4 cases of the exudative type no departure from the normal curve was found. Inasmuch as the heart was normal in these cases, the low blood-pressure was attributed to diminution in peripheral resistance. In the cases of proliferative tuberculosis, on the other hand, the arteries were found to be more elastic than in normal individuals of the same age. Fair agreement was noted between the elasticity found and the blood-pressure mathematically predictable on its basis. In cases of this type, therefore, Hochrein correlates the low blood-pressure with the greater elasticity of arteries.—*Über die Arterienelastizität bei der Tuberkulose, M. Hochrein, München. med. Wchnschr., September 10, 1926, lxxiii, 1512.*—(*E. R. L.*)

Experimental Amyloidosis.—Typical amyloidosis was produced in mice by feeding nutrose for 30 to 40 days, 60 per cent of the animals being affected. In addition, resorption of the amyloid masses was studied. The presence of amyloidosis was determined by a biopsy of the liver and, if present, nutrose injections were given, after which there occurred a marked reaction of the vascular endothelium and connective-tissue cells with a granulomatotic envelopment of the foci of amyloid.—*Zur Frage über Amyloidose und Resorption, Z. Morgenstern, Virchow's Arch. f. pathol. Anat., 1926, cclix, 698.*—(*H. J. C.*)

Mononuclear Phagocytes.—The determination of the origin of the mononuclear phagocytes, which are much less numerous in the normal blood than the granular polynuclear leucocytes, has been attended with great difficulty. Mallory in 1898 named the mononuclear phagocytes of typhoid lesions *endothelial leucocytes*. Since that time cumulative evidence has given much support to the view that the mononuclear phagocytes in the tissues and blood arise from endothelium. Aschoff and Kiyono by vital staining with colloidal dyes traced these free cells to the reticulo-endothelium. Recently, Sabin, Doan and Cunningham gave the first noteworthy evidence that these phagocytes are not of a single type by demonstrating in peritoneal exudate with supravital stains a cell with the neutral-red granules grouped in the *Hof* of the nucleus in the form of a rosette, in distinction to a second type with neutral red granules scattered diffusely. They concluded that the rosette type of cell is the monocyte, and that it arises in common with the granular leucocytes and lymphocytes from a mesenchymal or reticular stem-cell and that the clasmatocytes and the erythroblastic cells arise from the endothelium. In addition to the two types described above, McJunkin has found a third "hyaline" type with little affinity for neutral red. The use of the term *endothelial leucocytes* for mononuclear phagocytes names accurately the origin of these phagocytes. Separation of the group into the lymph-endotheliocytes of lymph-vascular origin and the hem-endotheliocytes of blood-vascular origin now appears possible, at least under certain experimental conditions. Sabin, *et al.*, constantly refer to the rosette type of cell as the monocyte of the rabbit's blood, and apply to it this term which Naegeli applied to the granular oxidase-reacting (benzidin-staining) mononuclear cell of peripheral human blood. Simpson found no mononuclear cells present in the blood of the rabbit which gave the oxidase reaction, and the writer has found this to be true for the peritoneal exudate cells so far as the peroxidase reaction with benzidin is concerned. In the present articles the methods of study are as follows: (1) phagocytosis *in vitro*, (2) peroxidase staining of smears with benzidin, (3) peroxidase staining with benzidin in paraffin sections, (4) supravital staining of leucocytes with neutral red, (5) Zenker-formaldehyde solution (formal) method of mordanting the supravital dye in smears, (6) iodin vapor method of mordanting the supravital dye in smears, and (7) Zenker-formaldehyde (formal) method of preserving supravital stains in paraffin sections. Full details of the different methods are given. In a study of the mononuclear phagocytes of guinea pig's blood the nonlymphocytic cells were found to average between 2 and 4 per cent of the total white-cell count, depending on the method and almost all of these nonlymphocytic mononuclear cells are lymph-endotheliocytes. Under certain pathological conditions the relative number of benzidin reacting mononuclears may be much increased. In an earlier report McJunkin and Charlton found as many as 10 per cent in the blood of guinea pigs with generalized tuberculosis, but only in the terminal stages. *Conclusions: 1:* Monocytes, mononuclear benzidin-positive phagocytes reacting to neutral red by the method of supravital staining, are present in normal human blood, and an occasional one is present in the blood of the normal guinea pig. These cells have not been demonstrated in rabbits' blood. They are increased in the blood of the guinea pig during the terminal stage of tuberculosis. Since they are found only in the bone-marrow and spleen, these fixed tissues are regarded as the probable source of their production. *2:* Lymph-endotheliocytes, benzidin-negative mononuclear phagocytes, that by the method of supravital staining react to neutral red (sometimes with the arrangement of the dye granules in the form of a rosette), are present in the peripheral blood of the normal guinea pig and rabbit, and in human blood. They are increased in the blood of the rabbit by intraperitoneal injections of whole rabbit's blood and in the guinea pig's blood during tuberculous infection. They arise from the lymphatic reticulo-endothelium. These leucocytes become transformed into the epithelioid cells of tubercle with preservation of their characteristic reaction to neutral red. *3:* Hem-endotheliocytes, benzidin-negative mononuclear phagocytes not reacting by the method of supravital staining to neutral red or reacting slightly to neutral red with the appearance of irregular dye cytoplasmic granules, have not been demonstrated in the normal peripheral blood. They appear in the blood of the rabbit following intravenous injections of India ink. These phagocytes, which react earlier and more intensively to intravenous carbon in suspension and to colloidal dyes than do other cells, probably arise from the vascular endothelium. *4:* By direct examination, therefore, three kinds of mononuclear phagocytes may be demonstrated in the circulating blood, two of which are found under normal conditions. Less direct evidence points to the conclusions that the benzidin-reacting phagocytes are derived from the bone-marrow and the spleen, and that the two benzidin-negative

phagocytes arise respectively from the lymph nodes and from the endothelium of capillary blood vessels. The term *monocyte*, proposed by Naegeli for the peroxidase reacting (benzidin-staining) mononuclear leucocyte should be applied to this particular cell alone, and not to the nonbenzidin reacting phagocytes arising from the endothelium.—*Identification of Three Types of Mononuclear Phagocytes in the Peripheral Blood, F. A. McJunkin, Arch. Int. Med., December 15, 1925, xxxvi, 799.*—(*J. S. W.*)

Transformation of Monocytes.—A few years ago, monocytes in pure culture were found by the authors to metamorphose under certain conditions into elongated or stellate cells, and to assume the appearance of fibroblasts, from which they become indistinguishable. This observation has been verified by Fischer, who has succeeded in obtaining a permanent strain of fibroblasts from a culture of leucocytes. The present paper describes the conditions that bring about the transformation of the monocytes, records attempts to reproduce these conditions, and gives the results of a study of the characteristics of the cell. In normal cultures the transformation of monocytes into fibroblasts generally occurred when cells became packed together through some mechanical factors that prevented their free migration and determined their accumulation. Under other conditions, when cultivated in a flask, the transformation does not take place. The transformation may begin around masses of apparently dead tissue. It seems as though the dying monocytes set free a substance which has the power of determining the metamorphosis of the other cells. Such transformation of the monocytes may be attributed to a change in the H-ion concentration of the medium, or to the setting free of some ferment or protein split-product by the dying tissue. An attempt was made to reproduce these conditions artificially in several different ways. Various modifications of the medium, the addition of dead tissue, and of trypsin or the products of trypsin digestion, failed to bring about the transformation. The inoculation of cultures of monocytes with filtered extract of Rous's sarcoma frequently resulted in the appearance of fibroblasts. The monocytes that are highly susceptible to the Rous virus become transformed into fibroblasts that are not sensitive to the virus, and that are not even a favorable medium for the growth of the virus. It seems as though there were a tendency for a susceptible cell to transfer itself into an immune cell. The first change undergone by the monocytes *in vitro* is a large increase in their size. They may become about ten times larger, and their length equals that of normal fibroblasts. Later, the giant monocytes become transformed into cells that do not essentially differ from those that grow from a fragment of adult connective tissue. It is well known that one of the more important cultural characteristics of monocytes is their inability to form tissue. Their transformation into fibroblasts generally occurs when on account of some change in the medium, the life of the cells as monocytes has become impossible. The monocytes transform themselves into cells capable of living under the conditions present in the culture, an adaptive change which may automatically be produced by substances set free by the monocytes themselves under certain conditions. The real significance of these facts cannot be understood until we know whether the transformation of monocytes into fibroblasts is reversible.—*The Transformation of the Monocytes into Fibroblasts through the Action of Rous Virus, A. Carrel and A. H. Ebeling, J. Exper. Med., April 1, 1926, xliii, 461.*—(*J. S. W.*)

Relation between Pulmonary and Nonpulmonary Tuberculosis.—In cases of serous-membrane tuberculosis pathological changes in the lungs were found in 92 per cent, but in only 16.5 per cent was the pulmonary process at all marked. With tuberculosis of the peritoneum or ribs there was little tendency for the lung to be actively involved. On the other hand, in 192 cases of severe progressive pulmonary tuberculosis, changes in the lymph nodes, bones and serous membranes were found only three times.—*Über ein Wechselverhältnis zwischen Tuberkulose der Lungen, Knochen und serösen Häute, M. A. Rosow and G. S. Japolsky, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 116.*—(*H. J. C.*)

Physiological Intrapleural Pressure.—There has been much discussion about the measurement of the "initial intrapleural pressure" since the introduction of Forlanini's method of pneumothorax. It is assumed that there is an intrapleural "space" and that the "pressure" within it can be more or less exactly measured. The negative readings obtained after puncture have been translated into a force equal and contrary to the pulmonary elasticity. However, some authors, for instance, Samuel West, have explained the approximation of the pleural layers by adhesion. Recently Rist and Strohl have rejected previous explanations of the "pleural space," and explain all the observed phenomena on a basis of the laws of diffusion of gases, through

serous membranes. *1: Intrapleural Pressure and Diffusion of Gases:* When an insufflation is made into the serosa there rapidly occurs an exchange of gas between the tissues and the collection of gas whose composition becomes modified. At the end of a certain period, no matter what the original composition, we find the following proportions: oxygen, 6 per cent; carbon dioxide, 6 per cent; and nitrogen, 88 per cent. Naturally, with the appearance of an exudate, especially a purulent one, conditions change; there is a fixation of oxygen and more abundant production of carbon dioxide, or even occasionally hydrogen sulphide. Rist and Strohl have shown the applicability of chemical formulas to these changes, and that the sum of the partial pressures of the gases in the body or its fluids approximates 90 per cent of the atmospheric pressure; hence gas introduced into the pleura will diffuse toward the tissues. For diffusion to occur in a reverse direction the intrapleural tension would have to be less than 90 per cent to the atmospheric tension, or less than 97 cm. water, a figure never obtained. The coefficient of diffusion of nitrogen, oxygen and carbon dioxide were found by Rist and Strohl to be approximately 1, 2 and 40. They conclude that this diffusion of gases ends by maintaining a subatomospheric pressure in the serosa and the approximation of the pleural layers, without the intervention of pulmonary "elasticity," "adhesion" and other factors. It is doubtful whether their argument will suffice to explain conditions in the normal pleura. *2: Intrapleural Pressure and Intermolecular Adhesion:* West in 1887 observed certain penetrating wounds of the thorax to be followed by subcutaneous emphysema but no pneumothorax, and explained this by the force exerted by "adhesion." Stoevensandt attempted to demonstrate this by opening the pleura cautiously but was unsuccessful, pneumothorax resulting. West, however, showed that to separate two exposed serous surfaces, which were allowed to come together, a force of 325 gm. was necessary. Comparing this with the 7 mm. of mercury intrapleural pressure measured by Donders, he calculated that there was an extra force of 140 gm. due to adhesion. Brauer also attempted to demonstrate this force experimentally. Von Wyss also calculated that for a serous surface of 120 sq. cm. there would be required a force of 120 kg. to separate the two layers. He admits, however, that to explain the production of penetrating wounds without formation of pneumothorax, other factors are necessary. *3: Intrapleural Pressure and Pulmonary Elasticity:* When one introduces a trocar into the visceral pleura the relations are changed, and there is no force to counteract the contractile power of the lung tissues in the vicinity; hence they tend to withdraw and the customary negative reading on the manometer is obtained. The degree of this negative pressure will vary with the physical condition in the chest and quite probably with the part of the chest punctured. *Conclusions:* None of the present theories in regard to the "pleural space" is entirely acceptable. In the physiological state the pulmonary elasticity tends to separate the pleural layers but, as in the case of other serous membranes, there is also an adhesive force. The laws of diffusion of gases in pneumothorax do not encounter analagous conditions in the normal or "physiological" pleura.—*Étude critique sur la pression intrapleurale physiologique* (*vide pleurale*), *A. Bernon and F. Cardis, Rev. d. l. Tuberc., October, 1925, v, 614.*—(*A. P.*)

Tuberculosis and Acidity of Inflammation.—The old observation in bacteriology that tubercle bacilli grow easily on acid media finds its verification in the latest physicochemical investigations on inflammations. Every inflammation stimulates the growth of tubercle bacilli, and since the growth optimum lies in an average grade of acidity in inflammation, such as occurs in living tissues, these observations are of far-reaching clinical interest. The clinical observation was verified that tuberculosis is made worse by the concurrence of a mixed infection; and this, viewed from a molecular pathological standpoint, indicates that the acute inflammation increases the acidity of the tissue juices in chronic tuberculosis. Tubercle bacilli were grown on glycerine-potato and on Lockemann's protein-free synthetic medium of various hydrogen-ion concentrations, in order to note the effect on the growth of the bacilli and verify the clinical conception. Hydrogen-ion determinations were also made upon inflammatory fluids.—*Über Tuberkulose und Entzündungsacidose, H. Schade and F. Claussen, Beitr. z. Klin. d. Tuberk., 1925, lxii, 300.*—(*H. J. C.*)

Mechanical Retrogressive Action of Enlarged Bronchial Lymph Nodes on Heart and Lungs.—While the effects of cardiac conditions upon the lungs have been fairly well elucidated, the mechanical retrogressive action of enlarged bronchial lymph nodes upon the lungs has been little considered. The location of these nodes in the vicinity of the large vessels must exert a marked influence upon the blood-stream, especially upon the veins when blood-pressure is low. Aside from stasis occurring

in the vicinity of the venae cavae superior and inferior, this mechanical retrogressive action must also be perceptible upon the intrathoracic organs, the lung and heart. Since bronchial lymph-node tuberculosis occurs primarily in early life, the prolonged diminished blood supply causes hypoplasia of the right heart and capillary system of the lungs, leading to a stunted form and content of the thorax, so that asthenia results. The asthenic habitus is therefore not a primary constitutional affair but the secondary result of early tuberculous infection. Clinical diagnosis of the condition is extremely difficult, even roentgenologically. Early diagnosis, however, is extremely important. X-ray therapy of these lymphomata may be of value, on account of their high radiosensitivity and the small dose necessary in early childhood, when using a suitable technic without danger of producing developmental disturbances. Before treatment, however, diagnosis must be made, in order to exclude cases of purulent nature.—*Mechanische Rückwirkungen bronchialer Lymphome auf Herz und Lungen, J. Kottmaier, Beitr. z. Klin. d. Tuberk., 1926, lxii, 773.*—(*H. J. C.*)

Key to Abstractors

A. K. K.: Allen K. Krause, Baltimore, Md.
A. P.: Andrew Peters, Loomis, N. Y.
B. T. McM.: B. T. McMahon, Northville, Mich.
E. R. L.: Esmond R. Long, Chicago, Ill.
E. H. K.: E. H. Kerper, Loomis, N. Y.
F. M.: F. Murray, Loomis, N. Y.
H. J. C.: H. J. Corper, Denver, Col.
H. S. W.: H. S. Willis, Baltimore, Md.
J. S. W.: J. Stanley Woolley, Loomis, N. Y.
M. P.: Max Pinner, Northville, Mich.
P. J. W.: Park J. White, St. Louis, Mo.
U. E. Z.: U. E. Zambarano, Northville, Mich.
W. B. S.: Willard B. Soper, New Haven, Conn.
W. I. W.: Walter I. Werner, Northville, Mich.